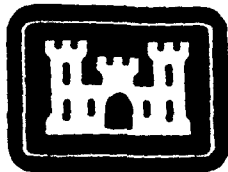


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New Orleans District

Cultural Resources Series

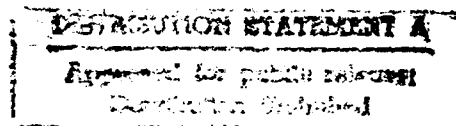
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**CULTURAL RESOURCES SURVEY OF EABPL
OFF-SITE BORROW AREAS, LEVEE ITEMS
E-64, E-76, AND E-84a, IBERVILLE, IBERIA,
AND ASSUMPTION PARISHES, LOUISIANA**

Final Report

July 1994

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<p>This report presents the results of a cultural resources survey of three proposed offsite borrow areas near the East Atchafalaya Basin Protection Levee (EABPL). EABPL Item E-64 is located on the west bank of the Lower Grand River just below the Bayou Sorrel Lock in Iberville Parish. EABPL Item E-76 is located on the west bank of Little Goddel Bayou near the southeastern corner of Iberia Parish. Item E-84a is located just west of LA Highway 70 below the town of Pierre Part in Assumption Parish. Intensive pedestrian survey utilizing lane spacing of 20 m and shovel tests at 50 m intervals was conducted on all three parcels. Survey transects were oriented parallel to the former distributary channels in order to maximize the potential for site discovery. One historic site 16IV23, was located during survey in Item E-64. This site is neither eligible nor potentially eligible for inclusion on the National Register of Historic Places.</p>					
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DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

March 28, 1994

Planning Division
Environmental Analysis Branch

To The Reader,

This cultural resources effort was designed, funded, and guided by this office as part of our cultural resources management program. Documented in this report is a cultural resources survey of three proposed borrow areas for improvements to the East Atchafalaya Basin Protection Levee. The purpose of the survey was to determine if significant archeological resources are located in the borrow areas.

We concur with the Contractor's conclusion that the project will not affect significant archeological deposits.

Michael E. Stout
Technical Representative

R. H. Schroeder, Jr.
Chief, Planning Division

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CHAPTER 1 INTRODUCTION

This report presents the results of a cultural resources survey of three proposed offsite borrow areas near the East Atchafalaya Basin Protection Levee (EABPL). All three borrow sites are located within high probability areas outside the limits of Gibson's (1982) comprehensive levee survey. Known prehistoric sites are located upon natural levee ridges and distributary channels in immediate proximity of the borrow areas.

The study area consisted of three parcels, each of which represented the location of a proposed borrow area. The first of these, EABPL Item E-64, is located on the west bank of the Lower Grand River just below the Bayou Sorrel Lock in Iberville Parish (Figure 1). EABPL Item E-76 is located on the west bank of Little Bayou Goddel near the southeastern corner of Iberia Parish (Figure 2). This item consists of site 1 of the former E-69 borrow area. Item E-84a is located just west of LA Highway 70 below the town of Pierre Part in Assumption Parish (Figure 3). This parcel is a new NODCOE right-of-way property where adjacent portions have previously been utilized for borrow activities. The three borrow areas represent a total of approximately 195 acres.

Intensive pedestrian survey utilizing lane spacing of 20 m and shovel tests at 50 m intervals was conducted on all three parcels. Survey transects were oriented parallel to the former distributary channels in order to maximize the potential for site discovery. The presence of standing water and areas of previous disturbance precluded shovel testing the borrow areas in their entirety. A single historic site was encountered in the Item E-64 borrow area. This site is not eligible for inclusion on the National Register of Historic Places. No archeological sites were discovered in the Item-76 or Item E-84a borrow areas.

Chapters 2 through 5 present background information on the geomorphology, natural setting, prehistory, and history of the project area. Chapter 6 summarizes the results of field investigations previously conducted within the vicinity of the project area. Chapter 7 is an overview of field investigations. Chapter 8 provides a summary of the results of fieldwork.

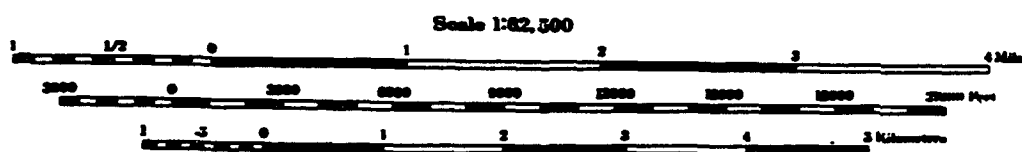


Figure 1. Exerpt from 1973 USGS Lake Chicot 15' quadrangle map showing the location of the Item E-64 borrow area.

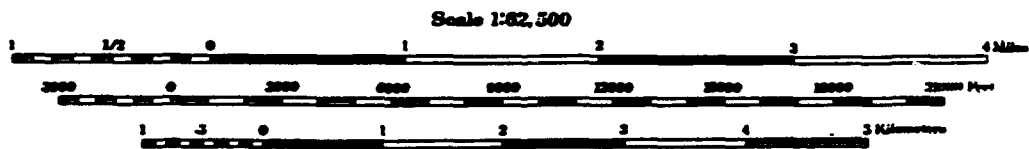


Figure 2. Excerpt from 1973 USGS Centerville 15' quadrangle map showing the location of the Item E-76 borrow area.

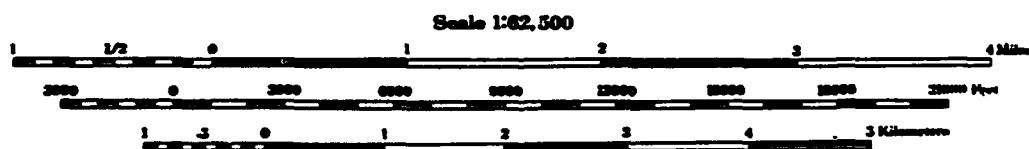
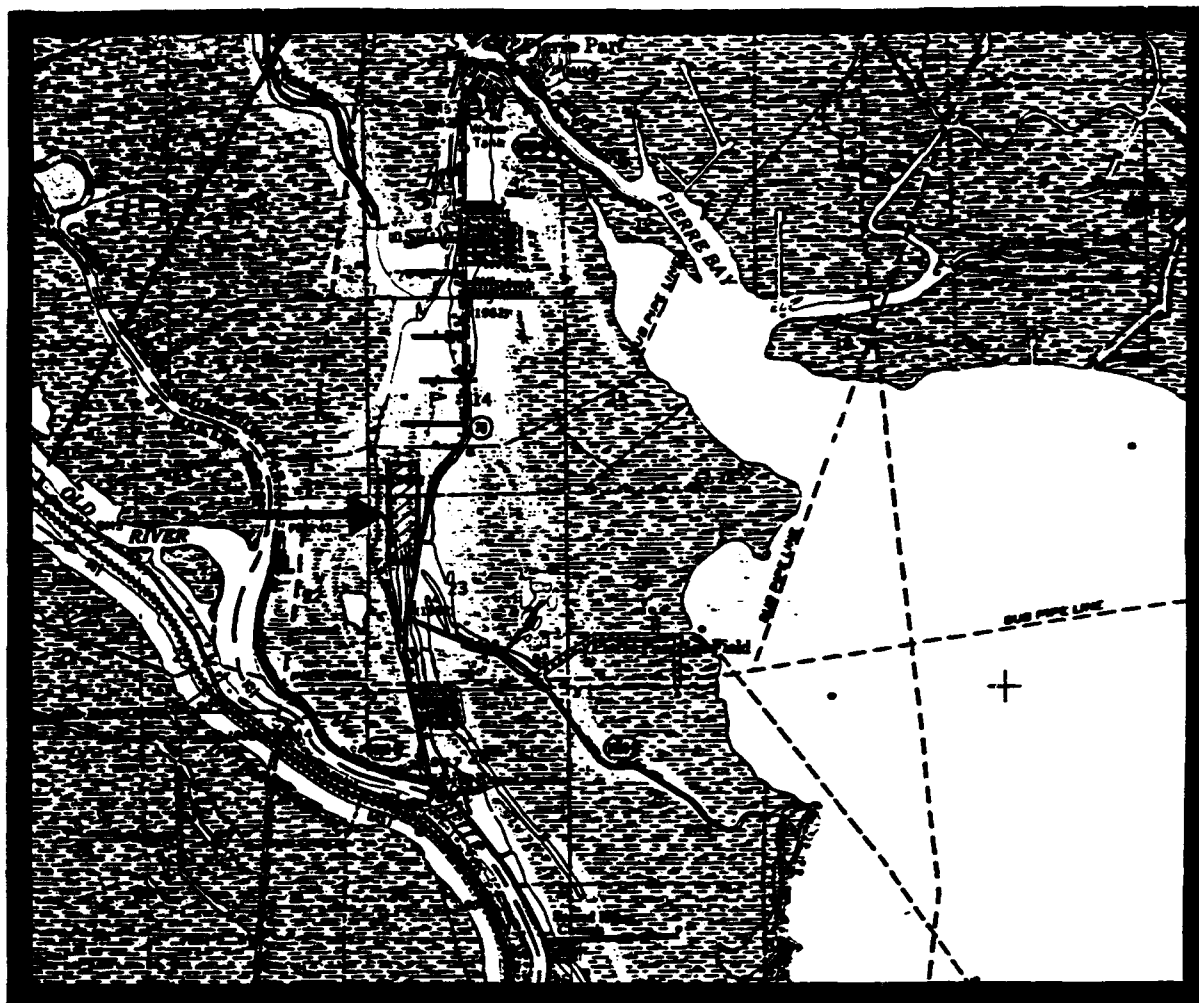


Figure 3. Excerpt from 1989 USGS Napoleonville 15' quadrangle map showing the location of the Item E-84a borrow area.

CHAPTER 2

GEOMORPHOLOGY AND GEOLOGY

by Paul V. Heinrich

Throughout the Late Holocene, the eastern edge of the Atchafalaya Basin has been dominated by tributary systems that channeled flood water from either a course of the Mississippi River or the trunk feeder channel of the Lafourche Delta Complex. The fluvial processes and forces associated with these tributary channels have constantly aggraded the alluvial plain of the eastern Atchafalaya Basin and reshaped the biological and depositional environments of this plain. Because of its dynamic nature, the inhabitants of the eastern Atchafalaya Basin have had to use either settlement selection strategies or, as in historic and modern times, artificial control structures in order to exploit the resources of this alluvial plain. As a result, the numerous environmental factors, which influence the distribution of archeological deposits throughout the project area, need to be understood in order to correctly interpret the archeological record. Thus, this chapter identifies and briefly describes those factors that influenced the use of the project area by prehistoric and historic Americans and later altered the cultural deposits they left behind.

Geomorphology

The Atchafalaya Basin is a backswamp of extraordinary size that occupies a large portion of the lower Mississippi Alluvial Valley. This backswamp lies within a large, roughly lens-shaped, shallow depression that is about 175 km (107 miles) long along a north-northwest to southeast trend and 55 km (34 miles) wide at the latitude of Baton Rouge. The boundaries of this basin consist of the natural levees of active and relict Mississippi River meander belts. The northeastern and eastern boundaries of this basin are formed by the modern Mississippi River meander belt, Meander Belt No. 1 of Autin et al. (1991). The natural levees of Meander Belt No. 1 rise as much as 10 m (33 ft) above the backswamps of the Atchafalaya Basin. An abandoned meander belt of the Mississippi River now occupied by Bayou Teche and designated "Meander Belt No. 3" by Autin et al. (1991) defined the western and southern boundaries of the Atchafalaya Basin. These natural levees are generally 5 to 6 m (16 to 20 ft) higher than the adjacent backswamps of the Atchafalaya Basin as far south as Centerville, Louisiana. The northern boundary of the Atchafalaya Basin consists of a relict Red River meander belt that bridges the 25 km (15 mile) space between Meander Belt No. 1 and Meander Belt No. 3 (Lenzer 1981; Saucier and Snead 1989; Smith et al. 1986).

By definition, the Atchafalaya Basin, except for the Atchafalaya River and its channel margins, is a large flood basin. A flood basin is a broad depression of low relief that lies between alluvial ridges of meander belts or a meander belt and a valley wall. A large flood basin, such as the Atchafalaya Basin, consists of both permanently to semi-permanently flooded swamps, called "backswamps," and open expanses of water in the form of fresh-water lakes. Both the backswamps and lakes receive large quantities of fine-grained, usually clayey, suspended sediments during floods. Otherwise, because of the high plant productivity of this flood basin and its shallow water table, large amounts of plant debris accumulate as a part of its clayey backswamp and lacustrine sediments.

As typical of other floodbasins in the Mississippi Alluvial Valley, the Atchafalaya Basin is characterized by a tributary drainage network inherited in large

part from older drainage systems. Although their associated landforms are buried by gradual alluviation during periodic floods, the original drainage channels often remain open to create a network of distributary channels that act as both distributary and tributary streams during floods. During early flood stages, these streams serve as outlets that distribute floodwaters from main distributary channels into the backswamp basin. When flood stage falls, the floodwaters retreat from the flood basin through many of the same channels which then serve to drain the backswamps. Within the Atchafalaya Basin, the original drainage pattern has developed into an anastomizing pattern in order to better disperse floodwaters throughout the backswamp. These channels usually diverge from the main Atchafalaya River Channel at low angles. The larger distributary channels carry a substantial, perennial base flow that can be as large as 20 to 40 percent of the main flow (Fisk 1947; Smith et al. 1986).

The three borrow areas lie within a strip of the Atchafalaya Basin that lies along its eastern edge. This strip lies between the natural levee of Meander Belt No. 1 and Bayou Lafourche, where it occupies the main feeder channel of the Lafourche Delta Complex. The western edge of this strip is defined by the EABPL. Prior to the construction of the protection levee, a number of channels originated as crevasses through the natural levee of Meander Belt No. 1 and Bayou Lafourche and spread out into the Atchafalaya Basin as an anastomizing system of distributaries. These distributaries eventually interconnect with distributaries of the Atchafalaya River. Bayou Latenache, Bayou Fordoche, and Bayou Plaquemine are major channel systems associated with well-developed distributary systems. Prior to the construction of levees along the Mississippi River, flood waters from the Mississippi emptied into the Atchafalaya Basin through these channels. With the construction of artificial levees along the Mississippi River, this area was isolated from sedimentation from these floods. With the construction of the EABPL, (ca. 1930-1940) the strip within which the study areas lie were isolated from sedimentation from the Atchafalaya River (Lenzer 1981).

South of the latitude of Donaldsonville, the eastern edge of the Atchafalaya Basin consists of the natural levee of Bayou Lafourche. As in case of the natural levees of the Mississippi River, the channels of these distributary systems originate as crevasses in the natural levees of Bayou Lafourche. These channels bifurcate into distributary systems that once fed floodwaters into the Atchafalaya Basin from Bayou Lafourche prior to the closure of Bayou Lafourche at its junction with the Mississippi River in 1910.

For this strip of the Atchafalaya Basin in which the project areas lie, a literature review found insufficient existing geomorphic mapping for the analysis of the geomorphology of the three borrow areas. Geomorphic mapping at a scale of 1:24,000 was found it to be either completely lacking or incomplete. In addition, geomorphic mapping at a scale of 1:62,500, e.g., May et al. (1984), was either nonexistent for the borrow areas or lacked sufficient detail to be useful.

Thus, in order to establish the geomorphic context of the three borrow areas, the geomorphology of the Atchafalaya Basin containing the survey areas was mapped at a 1:24,000 scale. This geomorphic mapping was made using black and white Soil Conservation Service aerial photography, infrared NASA imagery, soil surveys, and 7.5 minute topographic maps. Generally, the methodology of Smith et al. (1986) was used in interpreting the photographs.

A valuable source of geomorphic data is the set of 1:12,000 scale Edgar Tobin Aerial Survey black and white aerial photography donated by Exxon Company, Inc., to the National Cartographic Information Center of Louisiana State University. This set of aerial photographs, dated 1939-1941, were taken at the time that the right-of-way for the EABPL was being cleared of vegetation, but the levee itself was not yet being constructed within the study region. As a result, not only could preconstruction geomorphology free of the disturbance of levee construction could be clearly interpreted, but also the location of landforms obscured or destroyed by levee construction relative to the EABPL could be precisely determined. Also, its scale made it useful for mapping details that are unclear on the Soil Conservation Service photography.

Because of the distribution of survey areas and the distributary systems with which they were associates, the area for which the geomorphology was mapped consisted of all or part of eight 7.5 minute topographic maps. The geomorphology of three 7.5 minute series topographic maps, Lone Star (U.S. Geological Survey 1974a), White Castle (1974c), and Pierre Part (U.S. Geological Survey 1966) were completely mapped for this study. In addition, the geomorphology of three 7.5 minute series topographic maps, Bayou Sorrel (U.S. Geological Survey 1969a), Centerville NE (U.S. Geological Survey 1969b), and Pigeon (U.S. Geological Survey 1969c) partially mapped by Smith et al. (1986) was completed. Finally, the geomorphology of the Atchafalaya Basin portion of two other maps, Belle Rose (U.S. Geological Survey 1974a) and Napoleonville (U.S. Geological Survey 1975) were mapped. This geomorphic mapping defined two major distributary systems, the Bayou Plaquemine and Bayou Pierre Part distributary systems. In addition, significant drainage and topographic anomalies were found to be associated with both distributary systems.

Bayou Plaquemine Distributary System

The Bayou Plaquemine Distributary System consists of a major crevasse channel and an associated network of distributaries that connect it to interior bayous, streams, and lakes within the Atchafalaya Basin. The head of the Bayou Plaquemine Distributary System is a large crevasse channel, which is occupied by Bayou Plaquemine. Starting at Plaquemine, Louisiana, this crevasse channel cuts through the crest of the western natural levee of Meander Belt No. 1, down its exterior slope, and into the backswamps of the Atchafalaya Basin at Indian Village, Louisiana. At Indian Village, Louisiana, the crevasse channel joins a large distributary, which is called "Bayou Grosse Tete" north of this confluence and "Bayou Plaquemine" south of this confluence (U.S. Geological Survey 1953, 1969a).

South of the confluence between crevasse and distributary channels at Indian Village, Louisiana, the Bayou Plaquemine Distributary System consists of a well-defined single channel into which distributaries from the Atchafalaya Basin merge and from which distributaries branch out into this basin. Between Indian Village and Parks, Louisiana, its distributary ridge is about 2.3 km (1.4 miles) wide (Figure 4A). At Parks, Louisiana, this distributary channel merges with Upper Grand River, a distributary of the Atchafalaya River. Prior to being a distributary of the Atchafalaya River, the Upper Grand River likely alternated between being a "tributary" that drained the Atchafalaya Basin and to being a distributary up which Mississippi flood waters from Bayou Plaquemine flowed. At this confluence, the name of the main distributary

channel changes from being called "Bayou Plaquemine" to being called the "Lower Grand River" downstream of the confluence (U.S. Geological Survey 1969a).

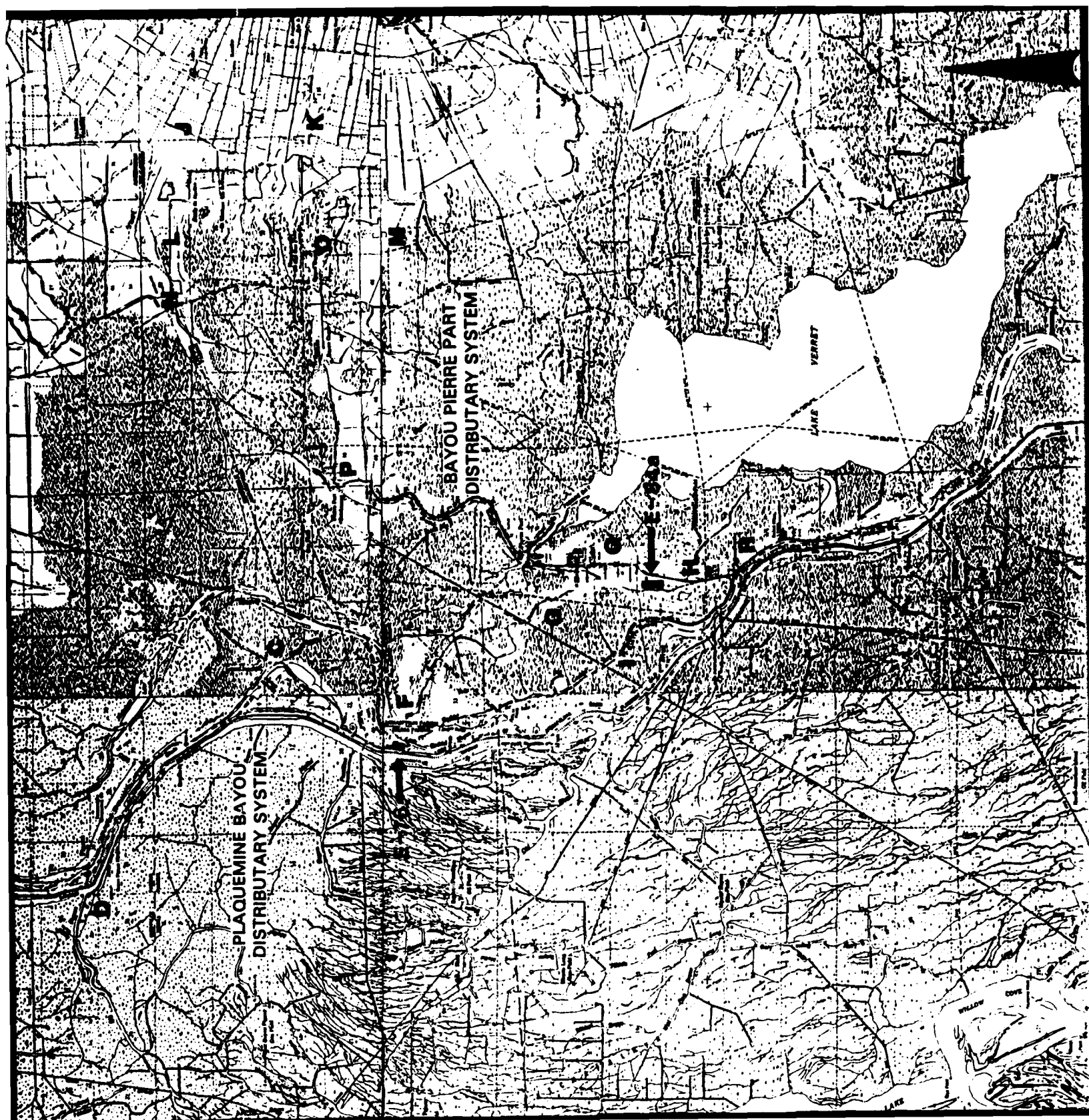
Further south along Lower Grand River, a distributary channel complex, called the "Schwing Distributary" in this report, branches off Lower Grand River within Sections 15 and 16 of T10 S, R11 E (Figure 4B). Although mapped as a crevasse channel associated with the adjacent Meander Belt No. 1 by Snead and McCulloh (1984), topographic mapping (U.S. Geological Survey 1969a, 1974c), and aerial photography clearly indicate that it is a partially abandoned distributary of the Lower Grand River. From the Lower Grand River, the Schwing Distributary extends about 7.5 km (4.6 miles) southeastward into Section 90, T10 S, R11 E. Adjacent to the Lower Grand River, the Schwing Distributary is about 2 km (1.2 miles) wide and consists of two anastomizing channels of which the northernmost is partially submerged by backswamp. Southeastward these channels merge into a single channel with a width only 0.7 km (0.4 mile) wide, which ends in a small birdfoot pattern of crevasse splays. All along this distributary, numerous crevasse splays are present (U.S. Geological Survey 1969a, 1974c).

The Schwing Place Mound Site (16IV13), which lies on the Schwing Distributary, dates this distributary and, by association, Bayou Plaquemine Distributary System. Various surveys of this site indicate that Tchefuncte through Mississippian and possibly Poverty Point components have been reported from this site. At the Bayou Sorrel Site (16IV4), which is located on Bayou Sorrel just downstream along Lower Grand River from the Schwing Distributary, another Poverty Point component might be present (Moore 1913; Jones and Shuman 1981). The Tchefuncte component clearly demonstrates that this distributary and, by association, the Bayou Plaquemine Distributary System are, at least, between 2,000 to 2,500 years old. If a Poverty Point component is present at both the Schwing Place Mound and Bayou Sorrel Sites, then the Bayou Plaquemine Distributary System is at least 2,500 to 3,500 years old (Weinstein and Kelley 1992). Thus, this archeological data shows that the Bayou Plaquemine Distributary System is as old as Meander Belt No. 1 (Autin et al. 1991).

South of its confluence with the Schwing Distributary and past Choctaw, Louisiana, the E-64 borrow area, and Pigeon, Louisiana, the Bayou Plaquemine Distributary System consists of a single, moderately sinuous channel, which ends within the northeastern corner of Section 16, T12 S, R12 E (Figure 4C). At the confluence of Bayou Pigeon the name of this channel changes from "Upper Grand River" to "Chopin Chute" (Figure 4D). Between Parks and Bayou Sorrel, Louisiana, the distributary ridge associated with this channel is 1.1 to 1.5 km (0.7 to 0.9 mile) wide. Between Choctaw and Pigeon, Louisiana, the partially exposed portions of the partially submerged distributary ridge is 0.7 to 1.0 km (0.4 to 0.6 mile) wide (U.S. Geological Survey 1969a, 1969c, 1974a; Matthews 1978).

Along this stretch, three major distributaries; Bayou Sorrel (Figure 4E), an unnamed distributary that has been partially obliterated by Bayou Sorrel Locks, and Bayou Pigeon merged with this channel prior to the construction of the EABPL (U.S. Geological Survey 1969a, 1969c, 1974a). The Edgar Tobin Aerial Survey photography clearly shows that the "Vs" of the confluences of all three distributaries point downstream just like the confluence of Upper Grand River. This configuration indicates that these streams, as in case of the Upper Grand River, likely for most of the





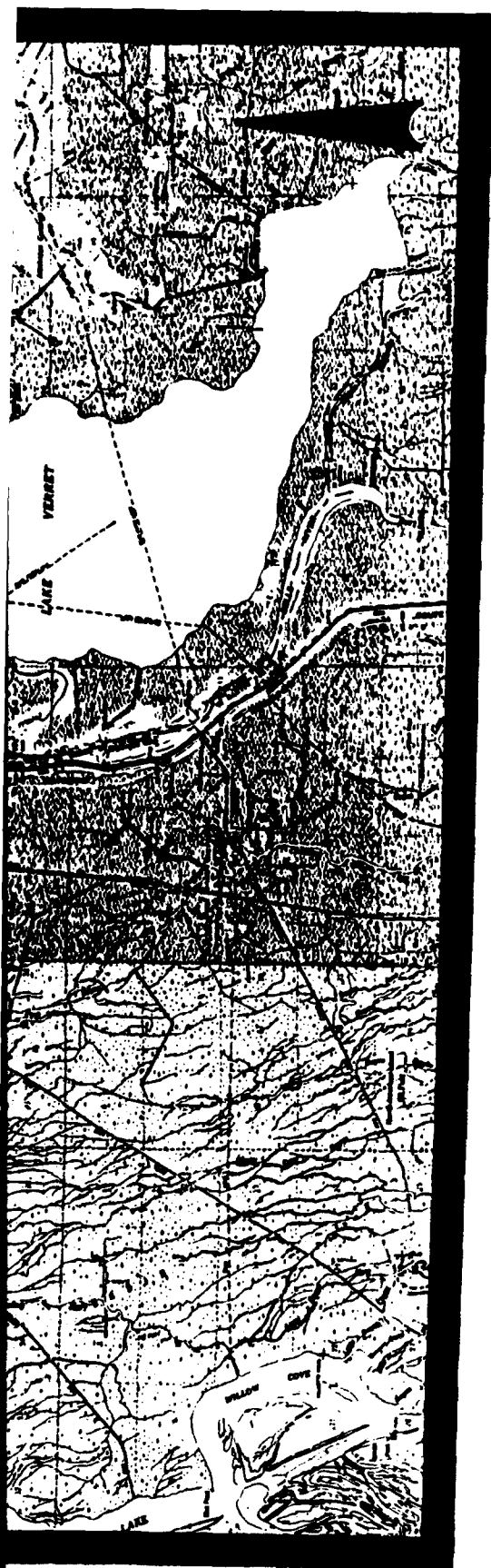


Figure 4. Excerpts from the Lake Chicot (1973), White Castle (1989), Centerville (1973), and Napoleonville (1989) USGS 15' quadrangles (reduced) showing the Plaquemine Bayou and Bayou Pierre Part Distributary Systems. Letters refer to features discussed in the text.

year fed water into the Bayou Plaquemine Distributary System, except when its main channel contained Mississippi River flood waters.

Within the northeast corner of Section 16 of T12 S, R12 E, the single channel of the Bayou Plaquemine Distributary System splits into three branches; Chopin Chute, Possum Bayou, and Postillion Bayou (Figure 4C). Currently, Chopin Chute, the easternmost branch, curves north and then swings east and empties into Lake Natchez Pass. However, geomorphic mapping showed that it apparently at one time continued eastward across Lake Natchez Pass and connected with an outlying distributary loop of the Bayou Pierre Part Distributary System. Prior to the construction of the EABPL, the westernmost branch, Bayou Postillion, swung southwest and then northwest into the Atchafalaya Basin where it bifurcated into smaller distributaries, such as Big Bayou Mallet. The construction of the EABPL beheaded this branch of this distributary system. Currently the central branch, Possum Bayou, trends southeastwards and disappears within the Atchafalaya Basin backswamp just north of Lake Natchez Bay. However, geomorphic mapping indicates that the Possum Bayou branch apparently continued southward, swung eastward through Bay Natchez, connected to and followed the course of Big Goddel Bayou at least to its junction with Bayou Natchez Distributary. If this reconstruction is correct, then Little Goddel Bayou, along which the E-76 borrow area lies, has always been a minor backswamp distributary marginally associated with the Bayou Plaquemine Distributary System. In general, the distributary ridges of these distributaries vary in width from 0.4 to 0.6 km (0.2 to 0.4 mile) (U.S. Geological Survey 1966, 1969b, 1969c, 1974a).

Within Section 29, T12 S, R12 E, the central branch of the Bayou Plaquemine Distributary System appears to bifurcate into two distributaries, Bayou Natchez and Big Goddel Bayou (Figure 4F). The Bayou Natchez Distributary trends southeastward as a moderately sinuous channels that disappears beneath the Bayou Pierre Part Distributary within Section 11, T13 S, R12 E (Figure 4G). Unlike Big Goddel Bayou, the Bayou Natchez Distributary exhibits well developed natural levees that are over 1.5 m (5 ft) in elevation and 0.4 km (0.2 mile) wide. At its southeastern end, these natural levees drop below 1.5 m (5 ft) in elevation. Within Section 34, T12 S, R12 E, a small crevasse splay extends from the Bayou Natchez Distributary as two bifurcating channels now occupied by Bayou Grosbec (U.S. Geological Survey 1966, 1969b).

The Big Goddel Bayou Mounds Site (16AS1) provides a minimum age for the Bayou Natchez Distributary. According to site files at the Louisiana Division of Archeology, this site, which consists of shell mound and midden about a meter (3 ft) thick, has Plaquemine, Coles Creek, and Marksville components. The presence of a Marksville component clearly shows that the Bayou Natchez Distributary is at least 1,600 to 2,000 years old (Weinstein and Kelley 1992).

Within Sections 14, 22, and 27 of T13 S, R12 E, aerial photography, soils mapping by Matthews (1978), and subtle details of U.S. Geological Survey (1966) define a small distributary plain composed of a set of branching distributaries that lies partially buried by the modern backswamp (Figure 4H). Currently, Old River forms the western boundary of this distributary plain. To the east, this distributary plain is buried by the Bayou Pierre Part Distributary System. Lying upon this distributary plain is the Goddel Ridge Site (16AS3), which is a shell midden containing Marksville (Mandalay Phase), Coles Creek (Bayou Cutler Phase), and Troyville components (Phillips 1970). The Mandalay Phase component at the Goddel Ridge Site (16AS3)

demonstrates that this distributary plain is at least 1,600 to 1,800 years old (Weinstein and Kelley 1992).

According to this archeological data, the small distributary plain is approximately the right age to either be the distal end of the Bayou Natchez Distributary or the distal end of an older phase of the Bayou Pierre Part distributary. A partially submerged distributary on which the Grand Bayou Site (16AS13), which contains a Marksville component, lies is an example of such an older Bayou Pierre Part distributary. However, this distributary is one of many Bayou Pierre Part distributaries with which the small distributary plain could have been associated. At this time, the best working hypothesis appears to be that the small distributary plain is the distal part of the Bayou Natchez Distributary.

Big Goddel Bayou might have been another branch of the Bayou Plaquemine Distributary System (Figure 4I). Partially submerged natural levees are evident along the southern portion of its course just upstream of its confluence with the Old River - Bell River course. The relationship of these natural levees to the small distributary plain is uncertain. Natural levees may have been present along the entire length of Big Goddel Bayou, but have subsided beneath the modern backswamp of the Atchafalaya Basin. At this time, additional research will be needed to determine whether Big Goddel Bayou was an original part of the Bayou Plaquemine Distributary System.

Significant drainage anomalies, of which the Bayou Natchez Distributary is the most prominent, are associated with the Bayou Plaquemine Distributary System (Figure 4F and G). In case of the Natchez Bayou Distributary, its natural levees, which are over 1.5 m (5 ft) high, end abruptly at its confluence with Big Goddel Bayou (U.S. Geological Survey 1969b). In contrast, the natural levees of the upstream portion Big Goddel Bayou, off of which the Bayou Natchez Distributary currently branches, have apparently subsided beneath the backswamps of the Atchafalaya Basin (Figure 4F). If Big Goddel Bayou and Bayou Natchez are part of the same distributary systems, then there has been over 1.5 m (5 ft) of differential subsidence between the two bayous.

The Schwing Distributary also shows possibly affects of neotectonics (Figure 4B). The trend of this distributary and a sharp bend in Lower Grand River closely parallels a major fault associated with the Sullivan's Lake Oil and Gas Field (Brown 1965; U.S. Geological Survey 1969a). If the gulfward dip of the fault is accounted for, the Schwing Distributary and the sharp bend segment of Lower Grand River lie along the downthrown edge of the fault where subsidence associated with the development of a roll-over structure should be greatest. The crevasse channel for the northernmost distributary lies where the fault traces should cross the natural levees of Lower Grand River. The southernmost crevasse channel lies where faulting antithetic to the main fault would cross the natural levees of the Lower Grand River.

If neotectonics has greatly affected the Bayou Plaquemine Distributary System, then reconstructing the history of it and this area is going to be extremely difficult. Neotectonics can significantly alter criteria, e.g. preservation of surface morphology, degree of submergence by backswamp, and soil development, that are used in geomorphic mapping and relative dating of the courses of distributaries crevasse channels. Because of this problem and the lack of subsurface data, the geomorphic mapping of drainage systems present in this report are tentative and should only be considered to be a working hypothesis based on the best available data. As a working

hypothesis, it needs to be tested with the acquisition of more archeological and geomorphic, particularly subsurface, data. As additional data is acquired and analyzed, the geomorphic mapping and interpretations presented in this report will inevitably be modified.

Bayou Pierre Part Distributary System

Geomorphic mapping of the eastern portion of the Atchafalaya Basin containing the three borrow areas defined a second distributary system, called the Bayou Pierre Part Distributary System. This distributary system consists of three well-defined segments of unequal length. The northernmost, proximal segment is characterized by a widespread, intricately anastomizing set of distributary channels that radiate from three portions of the relict natural levee of Bayou Lafourche. The central, medial segment of this distributary is composed of a short well-defined single channel and distributary ridge. The southernmost, distal segment of the Bayou Pierre Part Distributary System consists of a well defined distributary ridge from which numerous minor tributaries branch (U.S. Geological Survey 1966, 1974a, 1974b, 1975; Matthews 1978).

The northernmost, proximal segment of the Bayou Pierre Part Distributary System consists of a widespread system of intricately interconnected and anastomizing distributaries. These distributaries originate from one of three areas within the relict natural levees of Bayou Lafourche. Within Section 49 and 51, T12 S, R14 E, the northernmost distributaries originate as separate crevasse channels immediately east and northeast of Bruly St. Martin, Louisiana (Figure 4J). The northernmost of these distributaries is partially occupied by Bayou Crouix. Depending on how they are defined, six to eight distributary channels, which lie south of the previously described channels, originate from a major crevasse channel within Section 138 of T12 S, R14 E. Finally, a broad, poorly preserved ridge emerges from the relict natural levee of Bayou Lafourche within Sections 45 and 46 of T12 S, R13 E (Figure 4K). At this time, the crevasse with which this distributary ridge cannot be clearly determined because of insufficient data (U.S. Geological Survey 1974b, 1975; Matthews 1978). Although they originate from multiple crevasse channels, the ridges of these distributaries merge downstream into the single large distributary ridge of the central segment of this distributary system.

The majority of distributaries that comprise this northernmost segment are distributaries of a single crevasse channel that lies within Section 138 of T12 S, R14 E (Figure 4K). This crevasse channel is associated with a prominent reentrant, which is over 1.8 km (1.1 miles) long and 0.8 km (0.5 mile) wide within the relict natural levee of Bayou Lafourche. To the west, this crevasse channel divides and subdivides into a number of anastomizing distributary channels which spread out over a north-south distance of 5 km (3 miles) from the southern half of Section 21 (Figure 4L) to southern half of Section 42 (Figure 4M) within T12 S, R13 E. The southernmost, poorly preserved distributary within Sections 45 and 46, T12 S, R13 E, might also be related to this crevasse channel. However, its poor preservation and lack of data leaves the origin of this distributary uncertain at this time (U.S. Geological Survey 1974b, 1975; Matthews 1978).

Within the mass of intricately interconnecting distributaries that comprise this northernmost segment, three major distributary ridges can be recognized. The northernmost of these ridges extends westward from the relict natural levees of Bayou

Lafourche along LA Highway 996 within Section 22 of T12 S, R12 E (Figure 4N), and curves irregularly to the south along Bayou Pierre Part and merges with the other major distributary ridge, numerous crevasse splays and minor anastomizing distributary ridges branch. The most spectacular of these ridges, is an outer distributary ridge that branches off, circles 3 km (1.8 miles) to the north of, and reattaches to it. The middle, major distributary ridge emerges from the relict natural levees of Bayou Lafourche within Section 42 of T12 S, R13 E (Figure 4O). From there, this ridge extends eastwards through Grand Bayou, Louisiana, to Corne Bayou, Louisiana, where turns abruptly south and merges with the southern major distributary ridge. The southern major distributary ridges extends eastward from Sections 45 and 46 to Section 48 of T12 S, R13 E, where it jogs due north and merges with the middle major distributary ridge (Figure 4P). From there, it trends due east to Section 25 of T12 S, R12 E, where it merges with the northern major distributary channel to form a single distributary ridge (U.S. Geological Survey 1966, 1974a, 1974b, 1975; Matthews 1978).

Because of the multiple periods of channel formation, the lack of recorded archeological deposits on many of these distributary ridges, and the possibility that some channels were reoccupied after initial abandonment, it is currently impossible to establish a chronology for the formation of these distributary ridges. However, the available archeological data indicates that individual distributary ridges were active for differing periods of time. For example, the almost completely submerged southern major distributary ridge has archeological deposits, e.g. the Grand Bayou Site (16AS13) and Site 16AS30 with Marksville, Troyville-Baytown, Coles Creek, Plaquemine, and Mississippian components (Neuman 1978). The almost continual occupation of the Grand Bayou Site (16AS13) and the almost complete submergence of the distributary ridge by backswamp deposits indicate that the southern major distributary ridge ceased to be an active distributary ridge sometime prior to 1,600 to 2,000 B.P. In contrast, the presence of buried Troyville and Coles Creek components within the natural levee deposits of the northern distributary ridge at the Bruly St. Martin Site (16IV6) indicate that it was active between 1,600 to 1,150 B.P. (Springer 1973). On the other hand, the presence of surfacial Coles Creek and Plaquemine components at Site 16AS29 on the middle major distributary ridge indicates that it was active sometime prior to 800 to 1,300 B.P. (Weinstein and Kelley 1992). Thus, it can be hypothesized that these distributary ridges originated at and have been active for different periods of time during the past 2,000 years.

The central segment of the Bayou Pierre Part Distributary System lies between the confluence of the northern and southern distributary ridges within Section 25 of T12 S, R12 E, and Pierre Part, Louisiana, within Section 2 of T13 S, R12 E. The central segment consists of a single distributary ridge that is just 4 km (2.4 miles) long, over 1.5 m (5 ft) high, and associated with a single, well-defined channel. This channel is currently occupied by Bayou Pierre Part. Aerial photography show the presence of at least 8 crevasse channels of which some also show up as narrow breaks within the 5 ft contour of the natural levees through the natural levees of the left descending banks of the distributary. None of these crevasse channels were associated with observable crevasse splays (U.S. Geological Survey 1966).

The southern segment of the Bayou Pierre Part Distributary System is composed of a single distributary ridge off of which several minor distributaries diverge from its eastern edge. The western edge of this distributary ridge lacks any similar minor,

branching distributaries. With one major exception, these minor distributaries extend away from the distributary ridge to the southeast until they disappear beneath the adjacent backswamp, are truncated by the shoreline of Lake Verret, or a combination of both. The central portion of this segment of the Bayou Pierre Part distributary ridge rises in elevation above 1.5 m (5 ft), except for a 0.9 km (0.55 mile) long segment within the southern half of Section 14 of T13 S, R12 E (Figure 4Q). The E-84a borrow area lies within this topographic saddle within the crest of the distributary ridge. The western third of a significant stretch of the southern segment exhibits ridge and swale topography of unknown origin (U.S. Geological Survey 1966).

South of Belle River Church within Section 26 of T13 S, R12 E, Belle River forms the western edge of the Bayou Pierre Part Distributary System (Figure 4R). Although its natural levees are still greater than 1.5 m (5 ft) in elevation, the width of the distributary ridge narrows greatly. The distributary ridge extends southward along the Belle River until it disappears within the backswamp of the Atchafalaya Basin (U.S. Geological Survey 1966; Matthews 1978; Snead and McCulloh 1984).

Of the known archeological sites associated with the southern segment of Bayou Pierre Part Distributary System, archeological components have been identified only from the Graveyard Island Site (16AS22). At the Graveyard Island Site, a Coles Creek component has been identified. This suggests that the southern segment of the Bayou Pierre Part Distributary System prograded past the area of Belle River Church at least by 1,000 to 1,300 B.P. (Weinstein and Kelley 1992). However, this site only provides a minimum date for the formation of this portion of the distributary ridge. Its actual age is uncertain.

The Bayou Pierre Part Distributary System exhibits well-defined drainage anomalies. Within the northern segment, they include its extensive anastomizing distributary system and the reentrant in which its major crevasse channel lies. Within the southern segment, the saddle within its distributary ridge may reflect a zone of subsidence.

These drainage anomalies might reflect neotectonics associated with underlying salt domes and faults. The distributaries of the northern segment, which directly overlies the Napoleonville Salt Dome, might have been deranged by subsidence as a result of salt dissolution and uplift caused by salt tectonics. The large reentrant within the relict natural levee of Bayou Lafourche in which the primary crevasse channel of this distributary system directly overlies a large graben associated with the Napoleonville Salt Dome. This reentrant could be the surface expression of this graben. The saddle within the southern segment might reflect the surface trace of the fault associated with the Pierre Pass Field (Stipe and Spillers 1960; Limes 1965).

Sedimentation Processes

The eastern strip of the Atchafalaya Basin within which the borrow areas lie consist of two major depositional environments. These depositional environments, flood basin and channel margin environments, are definable by both the processes active within them and the distinct sedimentary deposits that result from these processes.

Within the Atchafalaya Basin, the flood basins consist of low, flat areas, called "backswamps," that are either covered or saturated with water and support a cover of woody vegetation with or without an undergrowth of shrubs. Within the Atchafalaya Basin, backswamps are classified as either well-drained swamps or poorly drained swamps. Within well-drained swamps, land is subaerially exposed, but saturated, during a large part of the year. Because of slightly higher elevations and efficient drainage channels, well-drained swamps are inundated primarily during periods of high flooding. As a result, within well-drained swamps, reducing and oxidizing conditions alternate during the accumulation of sediments. In contrast, poorly-drained swamps are inundated more or less permanently by standing, often stagnant, water. As a result, within poorly-drained swamps, reducing conditions exist while these sediments accumulate. Variations in the oxidizing and reducing conditions found within poorly- and well-drained swamps impart a distinctive character to the sediments which accumulate within each type of swamp. Because of the low sedimentation rates and infrequent to frequent subaerial exposure, backswamp sediments are preconsolidated by dewatering to create stiff, but highly fissured clayey deposits (Coleman 1966; Saucier 1974).

Well drained swamp deposits consist of light gray to light yellowish brown and dark brown, organically-poor clay with scattered silt lenses. Typically, these sediments are highly mixed by floraturbation and, thus, stratification is lacking or vaguely discernable. Well drained swamp deposits are typically highly fissured and preconsolidated as a result of periodic desiccation. Faunal remains of any type are rare in well drained swamp deposits as a result of the intense leaching and oxidation to which they are subjected. Well drained swamp sediments characteristically contain abundant nodules and small geodes of calcium carbonate (CaCO_3) and small nodules of iron oxides. Other diagenetic minerals such as pyrite (FeS_2) and vivianite ($\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$) are very rare (Coleman 1966; Krinitzsky and Smith 1969).

Poorly drained swamp deposits consist of organically-rich, black to bluish gray clays. These clays typically contain occasional laminations of silt, common laminations of compressed plant remains, and large, frequent wood fragments. Beds of woody peat often are also intercalated within the clays. Faunal remains present within poorly drained swamp sediments are commonly massive. Pyrite (FeS_2) and vivianite ($\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$) are the characteristic diagenetic minerals present within poorly drained swamp sediments. Because they are fully saturated, anaerobic micro-organisms remove oxygen from these sediments causing an deficiency of oxygen within them. As a result, iron and manganese are reduced into soluble forms and bluish, greenish, and grayish colors called "gleys" within sediments are formed (Coleman 1966; Krinitzsky and Smith 1969).

Large lakes, e.g. Lake Verret, also occur within the flood basins of the Atchafalaya Basin. Lacustrine deposits consist of sediment that have accumulated from suspension within open lakes and as lacustrine deltas. Lacustrine sediments that accumulate within the open lake typically consist of gray to black, soft, very organically-rich clays with scattered silt lenses and well-developed laminae. These sediments normally possess beds containing micro-mollusks and fresh-water pelecypods, e.g. *Rangia* and *Unio*, and gastropods. Sometimes these shells form beds that are a meter or so thick and tens of meters in extent. Diagenetic carbonate nodules and laminae of calcium carbonates (CaCO_3) and iron carbonates (FeCO_3) are abundant, with the iron carbonates, called "siderite," predominating. The lacustrine

delta deposits are characterized by a coarsening upward sequence ranging from basal, parallel laminated silty clays to cross-bedded and cross-laminated fine distributary sands (Coleman 1966; Krinitzsky and Smith 1969). The lithology and sedimentary architecture of lacustrine deposits are described in considerable detail by Tye (1986) and Tye and Coleman (1989).

During floods, some bedload and considerable suspended load escapes the banks of an active distributary channel with floodwaters and is deposited along the margins of this channel to create natural levees. If floodwaters uniformly overflow the banks of a channel, they spread out across the floodplain and their velocity abruptly decreases, because they are no longer confined by channel banks. Because of the baffling effect of flood plain vegetation, floodwaters lose additional velocity as they leave the river channel. As a result of their rapid loss of velocity, silt and sand suspended within these floodwaters rapidly settle out of suspension and accumulate along the margins of the distributary channel. Only the finer suspended clay is transported by unconfined floodwaters into the backswamp of the flood basin. Along the margin of the channels, loamy sediments accumulate incrementally with each flood to build low, wedged-shaped ridges, called "natural levees" paralleling the banks of the distributaries. Typically, natural levees are highest within a short distance of the bank and slowly decrease in elevation away from the banks. Distributary ridges consist primarily of natural levee deposits (Galloway and Hobday 1983; Smith et al. 1986).

Natural levees of distributaries typically consist of sandy loams, loams, silts, silt loams, and silty clays. These sediments are typically thickest and coarsest adjacent to the distributary channel and thin and decrease in grain size gradually away from the river until they interfinger with clayey flood basin sediments. The sediments of older, relict natural levees of distributary channels typically consist of massive, often iron-stained, stiff to very stiff, mottled brown to grayish brown, fine sandy loams, silts, silt loams, and silty clays. In case of younger, active natural levees of major distributary channels, these sediments may exhibit internal bedding and sedimentary structures that reflect rapid deposition by multiple, shallow flow events. The natural levees of the smaller distributaries within the Atchafalaya Basin consist of stiff gray clay containing a small percentage of silt and fine sand. They contain abundant plant roots and are sometimes, but not always, oxidized. Within the Atchafalaya Basin, natural levees are identified on infrared aerial photography by the vegetation which reflects the higher elevation of the natural levee above the adjacent swamp (Galloway and Hobday 1983; Smith et al. 1986; Farrell 1987, 1989).

Except for the most immature natural levee, natural levees are subaerially exposed for long periods of time between the brief flood stages when floodwaters overflow them. When subaerially exposed, natural levee sediments are compacted, oxidized, highly leached, and bioturbated by pedogenic processes and weathering. As a result, natural levees contain massive, buried weathering zones containing iron oxides, carbonate nodules, and iron oxide concretions. These characteristics reflect subaerial weathering and soil formation during subaerial exposure of natural levees between flood events (Fisk 1947; Galloway and Hobday 1983).

Project Areas

The mapping conducted for this project indicates that the three borrow areas that comprise the study area for this project lie within different geomorphic settings. The

E-64 borrow area lies on natural levees of a branch of the Bayou Plaquemine Distributary System. The E-76 borrow area appears to lie within backswamp adjacent to a minor distributary that connects with the distal end of the Bayou Plaquemine Distributary System. The E-84a borrow area lies on the major distributary ridge of the Bayou Pierre Part Distributary System. Associated with each of these geomorphic settings are different probabilities for the occurrence of archeological deposits.

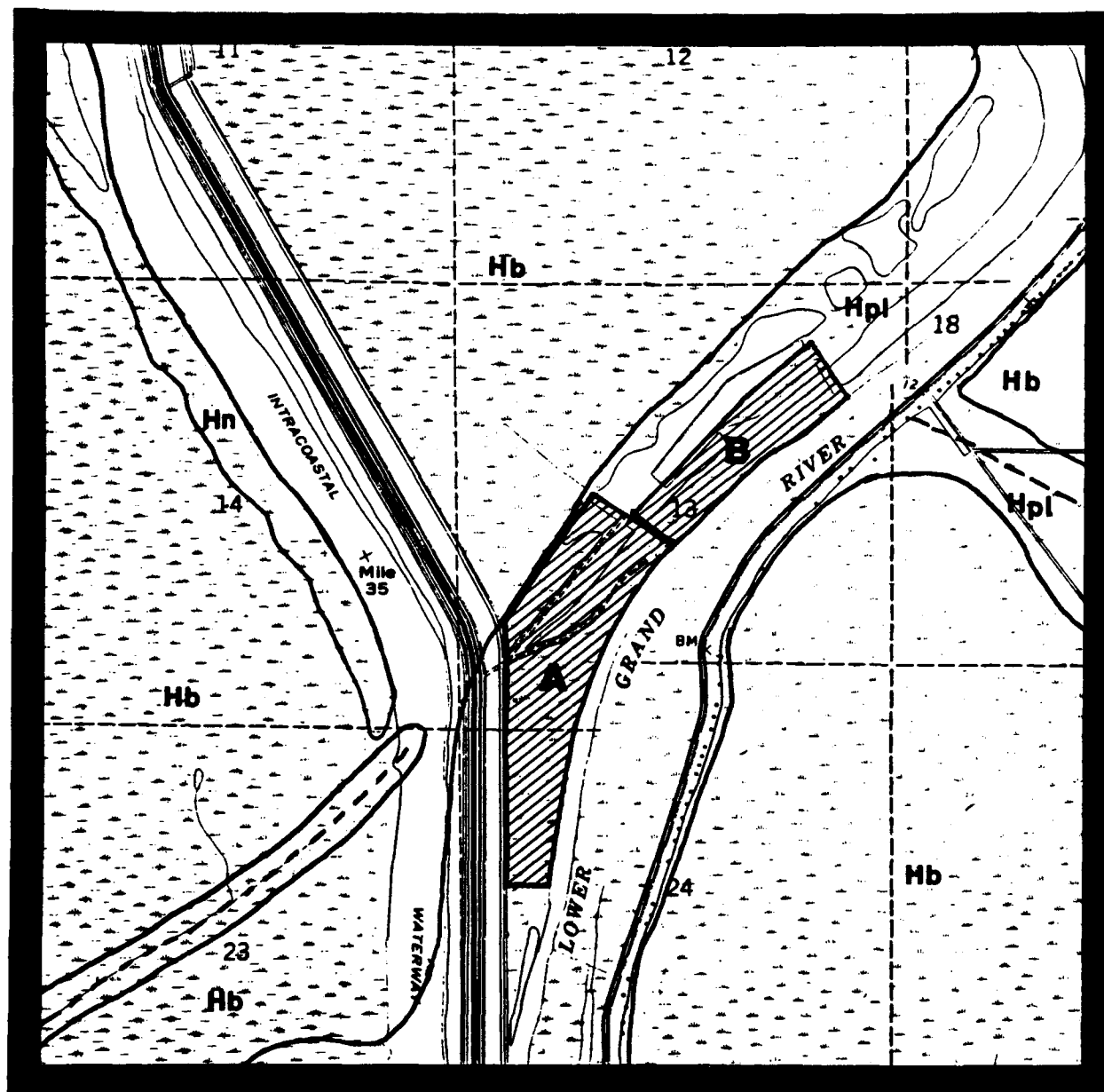
E-64 Borrow Area

The E-64 borrow area lies upon partially submerged natural levees of Lower Grand River (Figure 5). As previously discussed, the Lower Grand River is a major distributary of the Bayou Plaquemine Distributary System. Currently, only the highest portions of its natural levees, which are less than 1.5 m (5 ft) high, lie above the level of the adjacent backswamp. They consist of narrow strips of "land" that are about 46 to 180 m (150 to 600 ft) wide and parallel the modern channel of Lower Grand River. A large pond, which occupies about one quarter of the borrow area, represents a previous borrow area (U.S. Geological Survey 1969c).

Within the E-64 borrow area and its immediate vicinity, the natural levees of Lower Grand River and backswamp that lies east of them are mapped as Sharkey clay, frequently flooded. The Sharkey series is a poorly drained, very slowly permeable, strongly acid to moderately alkaline Vertic Haplaquept. The Sharkey series typically has a sola consisting of an A-Bg-Cg horizon sequence. It is typically 91 to 152 cm (36 to 60 inches) thick and developed entirely within clayey alluvium (Spicer et al. 1977; Clark and White 1978).

The Sharkey series is a Vertic Haplaquept, which is a type of Inceptisol. Inceptisols are relatively young soils with weakly developed pedogenic horizons formed by the removal, redistribution, and weathering of minerals and other materials within the parent material. By definition, they lack pedogenic horizons of accumulation, except for those composed of carbonates, organic matter, or amorphous silica. Permanently saturated Inceptisols of the flood and delta plains that have a light-colored and organically poor surface layer, called an orchic "epipedon," are designated as "Haplaquepts." When a soil is fully and permanently saturated as are Haplaquepts, the growth of anaerobic microorganisms causes a deficiency of oxygen within the soil. This deficiency of oxygen results in the reduction of iron and manganese into soluble forms and the formation of bluish, greenish, and grayish soil colors called "gleys." They suffix "g" that forms parts of the designations of the Bg and Cg horizons indicates that strong gleying has occurred within these horizons. The modifier "Vertic" indicates that the sola of Vertic Haplaquepts shrink and crack as they dry out at once a year and swell when they are wetted again. As a result, the sola of Vertic Haplaquepts possess slickensides and are prone to a limited degree of churning by argilliturbation (Smith et al. 1973; Soil Survey Staff 1975).

The backswamp immediately northwest of this borrow area is mapped as Fausse association. Its consists primarily of 80% Fausse soils with the remainder consisting of Sharkey clay. The Fausse series is a very poorly drained, very slowly permeable, slightly acid to mildly alkaline Typic Fluvaquent. A typical Fausse series solum has a A-Bg-Cg horizon sequence that is 64 to 117 cm (25 to 46 inches) thick and developed entirely within clayey sediments. An O horizon that is less than 5 cm (2 inches) thick sometimes overlies the A horizon (Spicer et al. 1977; Clark and White 1978).



- Hb Backswamp
- Hpl Plaquemine Bayou Distributary Complex
- Boundary
- - - Relict Bayou on Aerial Photograph
- ▨ Item E-64 Borrow Area

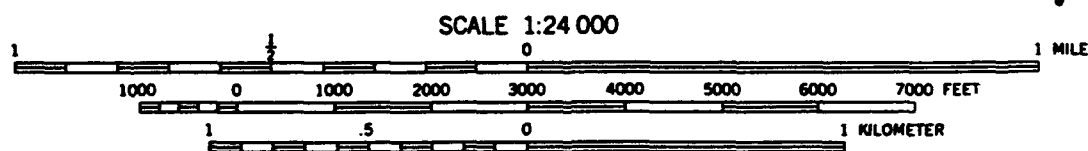


Figure 5. Excerpt from the 1980 USGS Pigeon 7.5' quadrangle showing geomorphic features in the vicinity of the E-64 borrow area.

The Fausse series is a Typic Fluvaquent. By definition, Typic Fluvaquents are Entisols developed in young, unaltered, clayey, and saturated alluvium. Within the Atchafalaya Basin, the upper tens of centimeters of these soils are semifluid. Because Fluvaquents are permanently saturated like the Haplaquepts, their soil horizons also exhibit well-developed gleys as indicated by the suffix "g" that forms parts of the designations for the Bg and Cg horizons of the Fausse series. The simple profiles that characterize Typic Fluvaquents are the result of insufficient time since the deposition of parent materials for the development of pedogenic horizons and the homogenization of its profile by the intense bioturbation by plants and burrowing animals (Craddock and Wells 1973; Soil Survey Staff 1975).

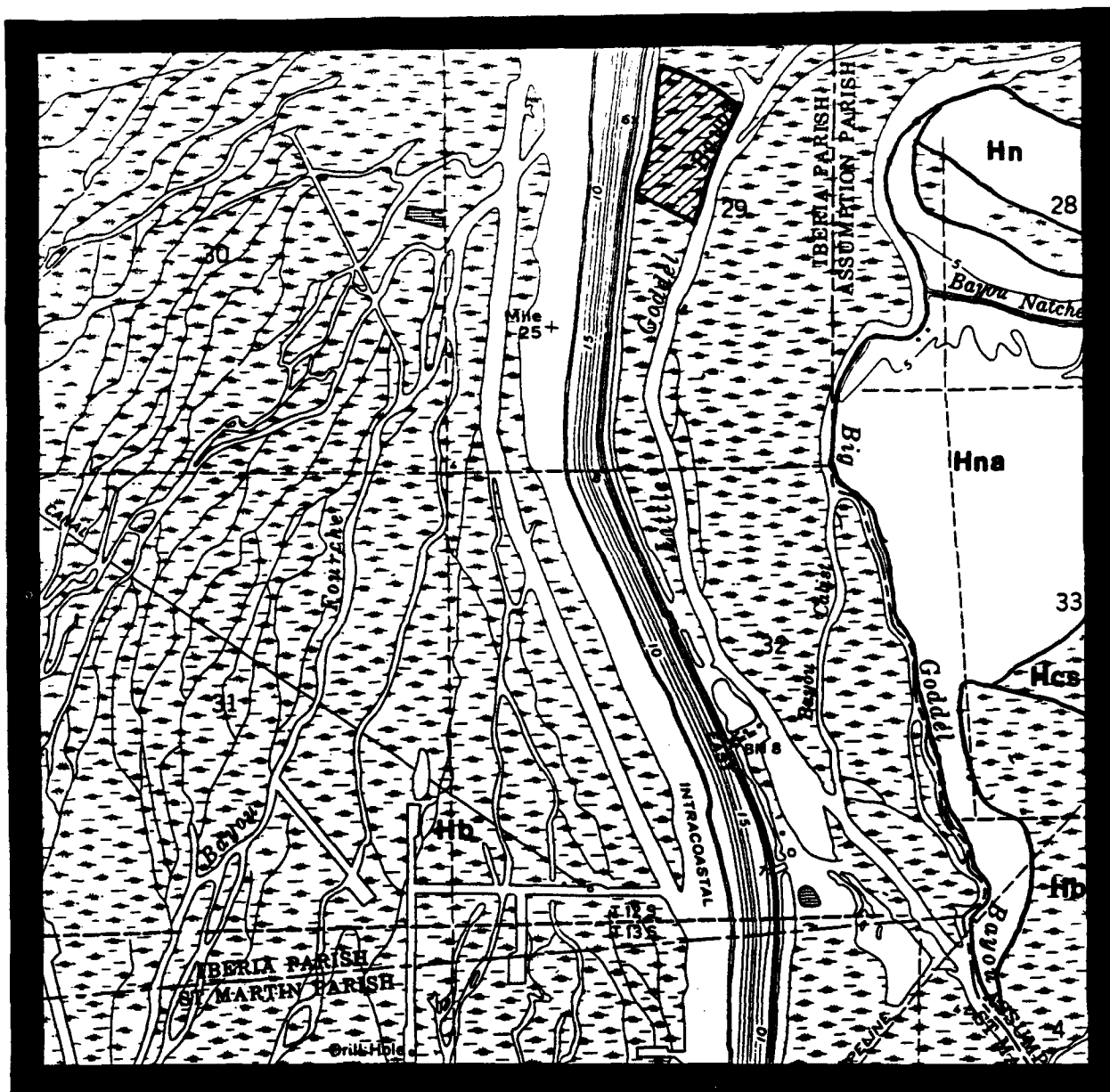
Sites with possible Poverty Point components, e.g. Schwing Place Mound Site (16IV13) and Bayou Sorrel Site, (16IV4), located respectively on the Schwing Distributary and Bayou Sorrel to the north demonstrate that this branch of Bayou Plaquemine Distributary System is as old as Meander Belt 1 of the Mississippi River.

E-76 Borrow Area

The E-76 borrow area lies within backswamp adjacent to the right descending bank of Little Goddel Bayou (U.S. Geological Survey 1969) (Figure 6). The geomorphic mapping produced for this study indicates that Little Goddel Bayou has very likely always been a minor distributary of the Bayou Plaquemine Distributary System. As a result, it lacks any significant natural levees suitable for settlement. Any small natural levees that Little Goddel Bayou might have had likely have long since subsided beneath and become part of the regional backswamp. Apparently, Big Goddel Bayou was the main branch of this system along which any development of natural levees occurred. However, because of the unexplained and anomalous development of natural levees along Natchez Bayou and the possibility of localize neotectonic subsidence during the Holocene, geomorphic relationships between and history of these bayous remain speculative. Spicer et al. (1977) have mapped the E-76 borrow area as Fausse association. The soils series that comprise the Fausse association have been previously described as part of the E-64 borrow area discussion and, thus, this material is not repeated. The presence of a Marksville component at the Big Goddel Bayou Mound Site (16AS1) on Natchez Bayou shows this segment on which the borrow area lies existed by at least 1,600 to 2,000 B.P. These older natural levee deposits are likely buried at a significant depth, possibly a few meters, below the present surface of the natural levee.

E-84a Borrow Area

The E-84a borrow area lies within the southern portion of a prominent distributary ridge that is part of Bayou Pierre Part Distributary System (Figure 7). The eastern edge of this borrow area contains the main abandoned channel of this distributary system. Aerial photography show that this distributary ridge within the E-84a borrow area exhibits anomalous ridge and swale of unknown origin. The mapping prepared for this study indicates that the western edge of this borrow area lies along the western edge of this distributary ridge where it apparently overlaps older, distal distributaries of the Natchez Bayou distributary ridge. As will be later discussed, a significant potential exists for the occurrence of buried sites at the buried surface of the older, possibly Natchez Bayou, distributary deposits.



- Hb Backswamp
- Hn Natural Levee (undifferentiated)
- Hna Natchez Bayou Distributary
- Hcs Crevasse Splay
- Boundary
- ▨ Item E-76 Borrow Area

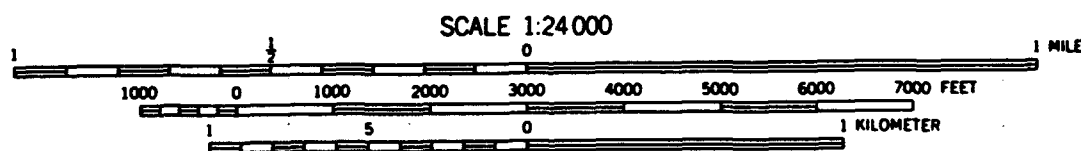
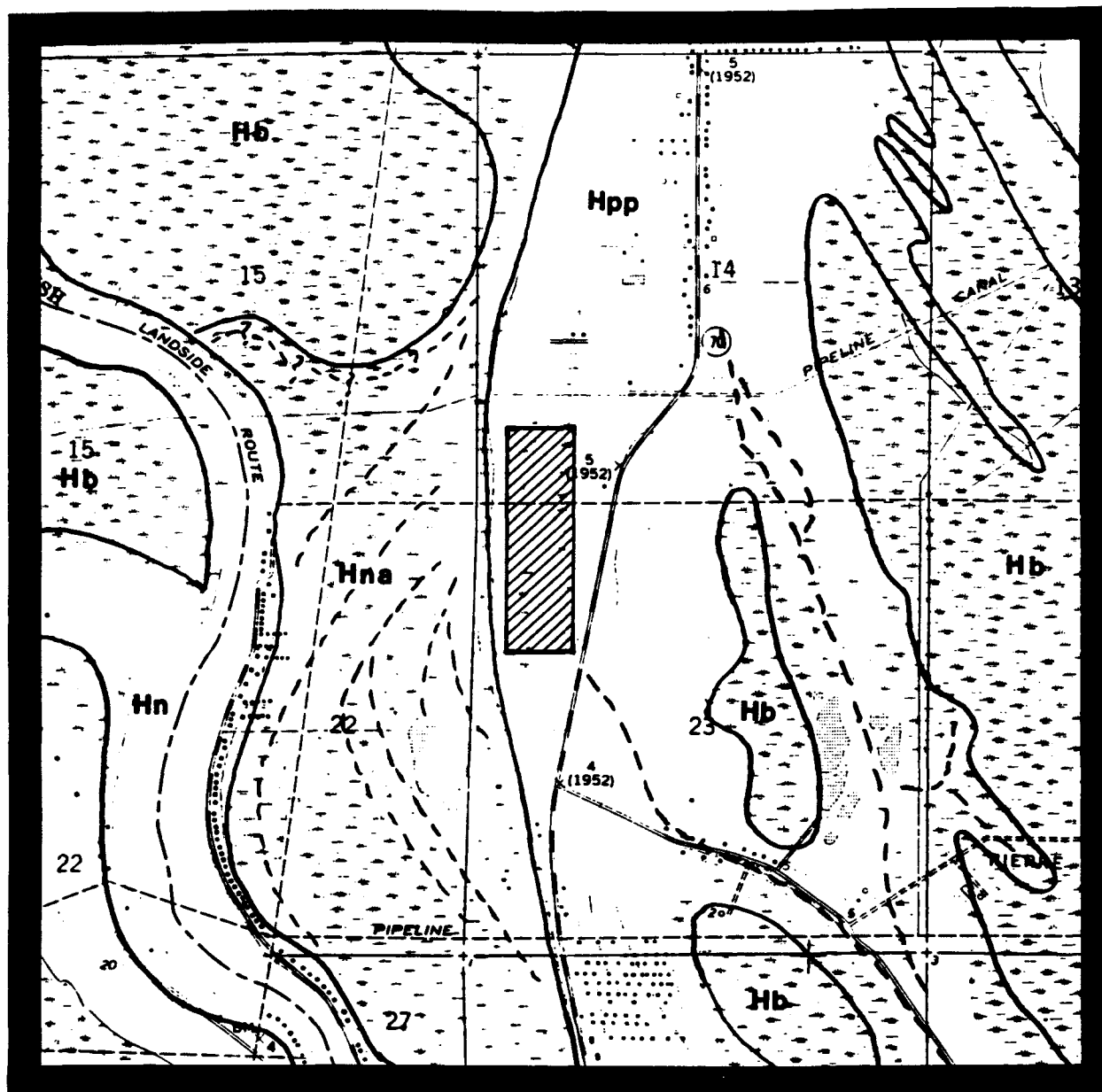


Figure 6. Excerpt from the 1980 USGS Centerville 7.5' quadrangle showing geomorphic features in the vicinity of the E-76 borrow area.



- Hb Backswamp
- Hna Natchez Bayou Distributary
- Hpp Bayou Pierre Part Distributary Complex
- Boundary
- - - Relict Bayou on Aerial Photograph
- ▨ Item E-84a Borrow Area



SCALE 1:24 000

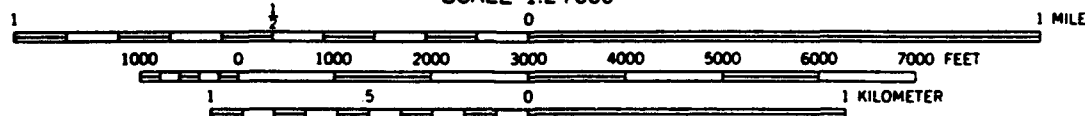


Figure 7. Excerpt from the 1980 USGS Pierre Part 7.5' quadrangle showing geomorphic features in the vicinity of the E-84a borrow area.

Between Pierre Part and Belle River, the Bayou Pierre Part Distributary System exhibits a systematic distribution of soils. Typically, the crest and upper slopes of this distributary ridge and two of its distributaries are associated with Commerce silty clay loam. Also, except the segment in which E-84a borrow area lies, the ridge and swale topography is normally characterized by Commerce silty clay loam. The lower, distal edges of this distributary ridge and its minor distributaries are typically characterized by Fausse association (Matthews 1978; U.S. Geological Survey 1966).

The E-84a borrow area lies within a 0.3 km (0.5 mile) -long segment of the main distributary ridge of the Bayou Pierre Part Distributary System which has suffered subsidence relative to the distributary ridge north and south of it. This segment, completely lies below 1.5 m (5 ft) unlike the distributary ridge to the north and south of it. This segment of distributary ridge, unlike adjacent portions of the distributary ridge, contains north-south strips of Fausse association on either side of its former distributary channel and adjacent to the edge of the ridge within the ridge and swale topography. Also, Commerce silty clay loam which normally characterizes the main distributary ridge occupies only two very north-south narrow strips separated by a narrow, parallel strip of Sharkey silty clay loam and flanked by the strips of Fausse association. The strips of Commerce silty clay loam, Sharkey silty clay loam, and Fausse association all cross E-84a borrow area (Matthews 1978; U.S. Geological Survey 1966).

The Commerce series is a somewhat poorly drained, medium acid to moderately alkaline Aeric Fluvaquent. Typically, the solum of the Commerce series has a simple A-B-Cg horizon sequence that is 66 to 102 cm (26 to 40 inches) thick. It is developed within loamy alluvium. The Commerce series is a Fluvaquent, which is a type of Entisol. Entisols are mineral soils that have little or no evidence for the development of horizons within 2 m (80 in) of the surface. They may have an A horizon and either mineral salts or silica at depth, a light-colored surface horizon, or a combination of both, but lack enough alteration of the parent material to have formed other horizons. Fluvaquents are permanently saturated Entisols that have developed in fine-grained alluvium. Aeric Fluvaquents are Fluvaquents that have soil coloration indicating that they somewhat better drained than the typical Fluvaquents. The simple profiles that characterize Typic Fluvaquents are the result of insufficient time since the deposition of parent materials for the development of pedogenic horizons and homogenization of the soil profile by the intense bioturbation (Craddock and Wells 1973; Soil Survey Staff 1975).

Geoarcheology

Within each distributary system, the distribution of archeological deposits exhibits patterns as to the type and location of sites. Excluding the Natchez Distributary, the known archeological deposits of the Bayou Plaquemine Distributary System consist of earth mounds located primarily on the natural levees of the primary and secondary distributaries of this system. Four of five known sites that contain earth mounds and are associated with the Bayou Plaquemine Distributary System occur on the natural levees of major, e.g., Sites 16IV4, 16IV13, and 16IV15, or minor distributaries, e.g., Site 16IB9, of the Bayou Plaquemine Distributary System. Site 16IV3 is the only site containing a mound or mounds lying directly upon the natural levees of the main channel, e.g. Lower Grand Bayou, of the Bayou Plaquemine Distributary System.

The relative late prehistoric age of Site 16IV3 and the absence of other sites from the natural levees of this main channel might indicate that the absence of other earth mounds might reflect cultural or natural processes. First, the almost complete lack of sites associated with these natural levees might reflect the continual burial of sites by annual flooding of the natural levees associated with the main channel of the Bayou Plaquemine Distributary System. Second, the annual flooding of the natural levees of the main channel of the Bayou Plaquemine Distributary System may have discouraged their occupation. Finally, a combination of these factors and a lack of a comprehensive archeological survey of the natural levees of the main channel of the Bayou Plaquemine Distributary System likely explain this lack of sites associated with the main channel of this distributary channels.

Exclusive of the Natchez Distributary, only three shell middens, presumably extraction locales, have been reported from the Bayou Plaquemine Distributary System. One of these sites, Site 16IB8, lies on the natural levee of a major distributary, Big Bayou Pigeon, of the Bayou Plaquemine Distributary System. Another of these sites, Site 16IV25, lies on a minor distributary, Little Bayou Pigeon, of this system. As shown by the Louisiana Archeological Survey Site Files, the last of these sites, Site 16IB7, lies within the backswamp between major and minor distributaries. The small number of known shell middens indicates that many such sites have yet to be found within this distributary system. Because of their relatively small size and negligible relief, it is likely that many of these sites have either been buried by recent sedimentation or remain unrecorded because of the lack of detailed archeological surveys.

The known archeological deposits associated with the Bayou Plaquemine Distributary System have been greatly impacted by cultural and natural processes. For example, the sites located west of the EABPL, e.g., Sites 16IB8, 16IB9, 16IV15, and 16IV25, have all apparently been buried by historic sedimentation. Other sites have been either severely damaged, e.g. 16IV4, or destroyed, e.g. 16IV3 and, possibly, 16IB9 by human activities within the survey region.

The archeological deposits associated with the Natchez Distributary have been found on its primary natural levees, on the natural levees of the crevasse distributaries now occupied by Bayou Gros Bec, and within the old distributary plain that is presumed to be its distal end. Lying directly on the natural levees of the Natchez Distributary are Sites 16AS1 and 16AS17. Site 16AS1, which consists of a mound and shell midden, lies on these natural levees at the confluence of Bayou Natchez and Big Goddel Bayou. The segment of natural levee on which Site 16AS17 lies is relatively undistinguished in appearance. A cluster of shell middens, Sites 16AS11, 16AS12, and 16AS5, lie on the natural levees of bifurcating crevasse splays now occupied by Bayou Gros Bec. These natural levees likely provided access that allowed convenient exploitation of the adjacent backswamp. A number of shell middens, Sites 16AS2, 16AS3, and 16AS4, have also been located on a partially submerged distributary plain which was presumably associated with the Bayou Natchez Distributary. Where this distributary plain lies buried by the Bayou Pierre Part Distributary System, e.g., possibly the western portion of the E-84a borrow area, buried archeological deposits might be associated with the surface of the distributary plain. Within the Bayou Natchez Distributary, the primary process that has adversely impacted archeological deposits has been bank erosion.

The known distribution of archeological deposits varies according to the segment of the Bayou Pierre Part Distributary System. Within the northern segment of this distributary system, the archeological sites, e.g. 16AS13, 16AS29, 16AS30, and 16IV6, are all located on the natural levees of distributary channels adjacent to confluences of a distributary channel with either another distributary or large crevasse channels. As evidenced by 16IV6, the potential for stratified archeological deposits is large within this segment of the Bayou Pierre Part Distributary System. In addition, the presence of buried archeological deposits is high, because the reoccupation of any of the many distributary channels would have buried any of the preexisting archeological deposits associated with them. The search for archeological deposits within this segment will require deep, extensive, and detailed subsurface testing of its natural levees.

Within the central segment of the Bayou Pierre Part Distributary System, only two small shell middens, Sites 16AS38 and 16AS39 have been recorded. Both of these sites are associated with a crevasse splay where it joins the main channel of the distributary system. Both sites appear to be small extraction locales. Both sites are partially submerged and have been impacted by dredging and bank erosion.

Additional archeological deposits, e.g. Sites 16AS10 and 16AS22, have been reported from the southern segment of the Bayou Pierre Part Distributary System. Site 16AS10 is a shell midden that has been reduced by wave erosion into a lag beach where the shoreline of Lake Verret is eroding the natural levees of a very minor distributary channel. Because Site 16AS10 was exposed by the erosion of the distributary channel and no other surface sites have been reported from these natural levees, other archeological deposits associated with these other distributaries might lie buried within their natural levees. Further south, another shell midden, Site 16AS22, has been reported from an island within the main distributary system.

CHAPTER 3 NATURAL SETTING

Introduction

The Atchafalaya Basin is a large area within south central Louisiana extending from the mouth of the Red River southward to the Gulf of Mexico. It encompasses a variety of landforms and ecosystems. The northern part of the basin is characterized by upland agricultural land. The basin's middle area is composed of an extensive system of lakes and bayous. The southern part of the basin is characterized by fresh water, salt water, and intermediate marshes. Throughout the basin, the highest areas are the natural levees, while the lower elevations are usually characterized as backswamps.

Climate

The Atchafalaya Basin is characterized by a humid subtropical climate. There is an influx of warm, moist, maritime tropical air from the nearby Gulf of Mexico. This maritime tropical air is displaced frequently during winter and spring by incursions of continental polar air from Canada, which occurs less frequently in autumn and only rarely in summer (Spicer et al. 1975:1-2). The mean temperatures for the basin range from 42° Fahrenheit to 63° Fahrenheit in January and 72° Fahrenheit to 91° Fahrenheit in August (Spicer et al. 1975:1-2). The annual rainfall varies from 36 inches to 100 inches (Murphy et al. 1974:2). Hurricanes and storm surges occur intermittently, and these have profound effects on floral, faunal, and human communities within the Atchafalaya Basin.

Plant Communities

As mentioned earlier, the highest elevations in the basin are on natural levees. Prior to clearing, these natural levees were occupied by upland forests. As the elevation decreases, the upland forests give way to bottomland hardwood forests, then to intermediate backswamp forests. At still lower elevations are the cypress-tupelo swamp forests. Finally, the cypress-tupelo forests yield to the marshes along the coast.

The woody species in an elevated natural levee forest include oaks (*Quercus virginiana*, *Q. alba*, *Q. nigra*, *Q. lyrata*), shagbark hickory (*Carya ovata*), hackberry (*Celtis laevigata*), sweetgum and blackgum (*Liquidambar styraciflua* and *Nyssa sylvatica*), pecan (*Carya illinoensis*), magnolia (*Magnolia* spp.), and various pines (Bahr et al. 1983:82). Other species include American elm (*Ulmus americana*), tallowtree (*Sapium sebiferum*), cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), water elm (*Planera aquatica*), boxelder (*Acer negundo*), rough-leaf dogwood (*Cornus drummondii*), mayhaw (*Crataegus opaca*), and waxmyrtle (*Myrica cerifera*) (Gibson 1978:114-115).

The bottomland forests are dominated by the water oak (*Quercus nigra*). Subdominants include the sweet gum (*Liquidambar styraciflua*), hackberry (*Celtis laevigata*), and live oak (*Quercus virginiana*). Other forest species include the boxelder (*Acer negundo*), honey-locust (*Gleditsia triacanthos*), American elm (*Ulmus americana*), Nuttall oak (*Quercus nuttallii*), pawpaw (*Asimina triloba*), persimmon (*Diospyros virginiana*), ashes (*Fraxinus* spp.), and yaupon (*Ilex vomitoria*) (Gibson 1978:96-97; White et al. 1983:103-104). The most common shrub species are

palmetto (*Sabal minor*) and green haw (*Crataegus viridis*). Vines are found throughout the bottomland hardwood forest, and few trees are observed without them. The most common of these include poison-ivy (*Rhus toxicodendron* var. *vulgaris*), Virginia creeper (*Parthenocissus quinquefolia*), supple-jack (*Berchemia scandens*), muscadine (*Vitis rotundifolia*), hemp-weed (*Mikania scandens*), touch-me-not (*Impatiens capensis*), water paspalum (*Paspalum* sp.), and pokeweed (*Phytolacca americana*) (Gibson 1978:97; White et al. 1983:104).

The backswamp occurring between the bottomland hardwood forests and the swamps is found throughout the basin. Swamp red maple, American elms, and water oaks are common here. Palmettos create a dense understory (White et al. 1983:105). Other species found in backswamps include tupelo-gum (*Nyssa aquatica*), bald cypress (*Taxodium distichum*), Virginia willow (*Itea virginica*), alligatorweed (*Alternanthera philoxeroides*), water hyssop (*Bacopa monnieri*), Frogbit (*Limnobium spongia*), swamp lily (*Crinum americanum*), whisk fern (*Psilotum nudum*), and lizard's tail (*Saururus cernuus*) (Gibson 1978:92).

The cypress-tupelo swamp forest, located a greater distance from distributaries, is dominated by bald cypress (*Taxodium distichum*). Water tupelo (*Nyssa aquatica*) is often either a sub- or co-dominant species. Red maple (*Acer rubrum* var. *drummondii*) and ash trees (*Fraxinus* spp.) represent the other sub-dominants in this community. Shrubs include wax-myrtle (*Myrica cerifera*) and button-bush (*Cephalanthus occidentalis*), while vines are cat-briar (*Smilax* spp.), trumpet creeper (*Campsis radicans*), and poison ivy. Herbaceous ground cover includes smart-weed (*Persicaria punctata*), swamp potato (*Sagittaria lancifolia*), and water hyacinth (*Eichhornia crassipes*) (White et al. 1983:105).

The marsh, with soils of peat and muck, has an elevation of less than one meter above mean sea level. Cord grass (*Spartina patens*) is dominant in the brackish or intermediate marsh, while swamp potato (*Sagittaria lancifolia*) predominates in fresh water marsh (White et al. 1983:106-107). Additional brackish marsh species include coast milkweed (*Asclepias lanceolata*), saltwort (*Batis maritima*), bindweed (*Convolvulus* spp.), and dodder (*Cuscuta geonovii*) (Gibson 1978:106). Additional fresh water marsh species include Carolina bacopa (*Bacopa caroliniana*), ammania (*Ammania coccinea*), pink hibiscus (*Rastetzkya virginica*), and gooseweed (*Sphenoclea zeylandica*) (Gibson 1978:102-193).

Fish

The Atchafalaya Basin hosts a diverse assemblage of fish and other aquatic species. Those found throughout the basin include three species of gar (*Lepisosteus oculatus*, *L. platostomus*, and *L. spatula*); paddlefish (*Polydon spathula*); largemouth and yellow bass (*Micropterus salmoides* and *Morone mississippiensis*); six species of sunfish including bluegill (*Lepomis macrochirus*); bowfin (*Amia calva*); crappie (*Pomoxis* spp.); at least three species of catfish (*Ictalurus furcatus*, *I. melas*, *I. punctatus*); and various other species. Also found are brackish-water clam (*Rangia cuneata*), river crawfish (*Procambrus blandingii*), red swamp crawfish (*P. clarkii*), freshwater snail (*Physa* sp.), and various other species of mussels, snails, and crustaceans (Gibson 1978:85-87; Jones and Shuman 1987:5-6).

Reptiles and Amphibians

The basin hosts a wide assortment of reptiles and amphibians. Most notable among the reptiles are the alligator (*Alligator mississippiensis*), cotton mouth moccasin (*Agkistrodon piscivorus*), copperhead (*Agkistrodon contortrix*), common king snake (*Lampropeltis getulus*), and at least seven species of lizard (Gibson 1978:85; Jones and Shuman 1987:5-6). There are at least thirteen species of turtle including the common snapping turtle (*Chelydra serpentina*), common mud turtle (*Kinosternon subrubrum*), and the box turtle (*Terrapene carolina*) (Gibson 1978:85; Jones and Shuman 1987:5-6). Finally, there are eleven species of salamander and thirteen species of frogs (Jones and Shuman 1987:5-6).

Birds

As might be expected, the basin has a wide variety of birds. Some of the most common birds of prey include the great horned owl (*Bubo virginianus*), barred owl (*Strix platypterus*), marsh hawk (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), and the bald eagle (*Haliaeetus leucocephalus*) (Gibson 1978:90; Jones and Shuman 1987:5). Non-predator birds include six species of heron, two species of egret, ibis, various ducks, woodpeckers, quails, and doves, plus an assortment of smaller birds (Gibson 1978:90; Jones and Shuman 1987:5).

Mammals

The Atchafalaya Basin hosts various herbivores, carnivores, and omnivores. The most notable of the herbivores include white tailed deer (*Odocoileus virginianus*), cotton tail rabbit (*Sylvilagus floridanus*), swamp rabbit (*Sylvilagus aquaticus*), gray squirrel (*Sciurus carolinensis*), and fox squirrel (*Sciurus niger*). The non-native nutria (*Myocastor coypus*) was not present during the prehistoric or early historic times. Some of the carnivores include mink (*Mustela vison*), bobcat (*Lynx rufus*), and the gray fox (*Urocyon cinereoargenteus*). The most common omnivores include skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and black bear (*Euractos americanus*) (Gibson 1978:100; Jones and Shuman 1987:5).

CHAPTER 4 PREHISTORY OF THE ATCHAFALAYA BASIN

Introduction

The Atchafalaya Basin is a unique, circumscribed, alluvial floodplain, and as such, settlement patterns differed from those found within the Lower Mississippi River Valley. Understanding settlement within the basin is facilitated by Kniffen's (1938:202) concept of age-area relationships. Age-area relationships are based on the premise that if the age of a given landscape is known, then the maximum age of all materials (natural and cultural) found in association with that landscape can be determined as well. The age of the landforms within Atchafalaya Basin are fairly well documented. The next step, then, is to determine if the sites reported in the Atchafalaya Basin have a distribution pattern which shows the interrelationships between sites and the age of the landforms on which those sites are found.

The optimal locations for occupation by prehistoric peoples in and around the Atchafalaya Basin were the natural levees. These areas were preferred because they provided optimum soil drainage, natural resource availability, proximity to transportation routes, and protection from natural hazards (Smith et al. 1986:73). As expected, archeological research to date indicates that these natural levees contain at least 40 percent of the known sites. Smith et al. (1986:73) reported that 22 of 55 sites reported were located on natural levees. This percentage suggests that prehistoric peoples located their settlements on natural levees. However, sites on natural levees also are observed more easily during archeological survey:

Due to the heavy siltation and increased subsidence within the basin, evidence of prehistoric occupation was usually limited to the natural levees [Neuman and Servello 1976:10].

Thus, it seems likely that the distribution of known sites also has been affected by sample bias. Unfortunately, the heavy siltation that has occurred in the Atchafalaya Basin within the last 50 years has effectively buried sites (Sherburne WFA Officer John Sturgis and Paul V. Heinrich, personal communication 1993). As a result, the remains of pre-Coles Creek cultures are virtually inaccessible unless they occur on the natural levees of older, larger distributaries, like the Bayou Fordoche-Bayou Marinqouin-Bayou Gross Tete distributary systems or on the Bayou Teche distributary systems. This problem was reviewed by Smith et al. (1986:77) who stipulate that, "Sites older than Coles Creek should be absent from all surfaces in the Atchafalaya Basin except the natural levees of larger distributaries." Smith et al. (1986:77) also suggest that, "...sites older than Marksville should be generally absent on the Lafourche distributaries. Based on Smith et al.'s (1986) work, Manning et al. (1987:33) suggest that, "Archeological sites on abandoned distributaries are probably less than 1500 years old, and probably never date before 3000 B.P."

Gibson (1982) proposed models for site patterning within the Atchafalaya Basin that further elucidate age-area relationships. The first model proposes that older sites are situated on the basin's periphery, primarily on the western side, and that younger sites are found on the eastern periphery as well as in the basin's interior (Gibson 1982). In terms of the age-area relationships, the older sites are associated with the Mississippi-Teche meander ridge which was active between 5800 to 3500 years B.P.

(Smith et al. 1986:44). This date would allow for the occupation of this area by Archaic populations. This 'peripheral model' predicts where older sites versus younger sites are located, and can be effectively tested by a sample of sites from the basin as a whole.

In addition, populations grow and expand across the landscape over time, and more recent cultures, such as the Coles Creek, will venture into areas which were not formally inhabited. This suggests that recent cultures are not restricted solely to recent landscapes. Chronologically younger cultures can and do inhabit both older and more recent landforms. Thus, the peripheral model by itself is inadequate for describing the relationship of younger cultures to their environments. Instead, a village fission-fusion model appears to be applicable to sites dating to the Coles Creek and later. This model was discussed by Gibson (1982:85-94) and Manning et al. (1987:29). In the northern and middle portions of the basin, Gibson (1982:85) proposed a settlement pattern whereby small residential hamlets of a few families budded off from the larger main village. In the southern portion of the basin, the settlement pattern appears to be that of spring and summer fission, with dispersed marsh/bay settlements, and fall and winter fusion for the occupation of larger inland sites (Gibson 1982:93-94). This "fission-fusion model" was created to discuss cultures which have complex socio-economic structures and that have settled, larger villages for at least a portion of the yearly cycle.

A representative sample of sites in and around the basin is discussed below. The peripheral model and the fission-fusion model are applied to these sites in an effort to examine the age-area relationships within the Atchafalaya Basin

Geographic Divisions

To facilitate an understanding of the location of sites discussed below, the Atchafalaya Basin has been divided into three areas (Figure 8). The northern area starts at the head of the Atchafalaya River and ends at U.S. Highway 190. The middle area starts on the southern side of Hwy. 190 and continues south to the northern boundary between St. Martin and Iberia Parishes. The southern area starts south of the northern boundary between St. Martin and Iberia Parishes and continues to Morgan City. For the location of all sites discussed in this chapter, refer to Figure 8.

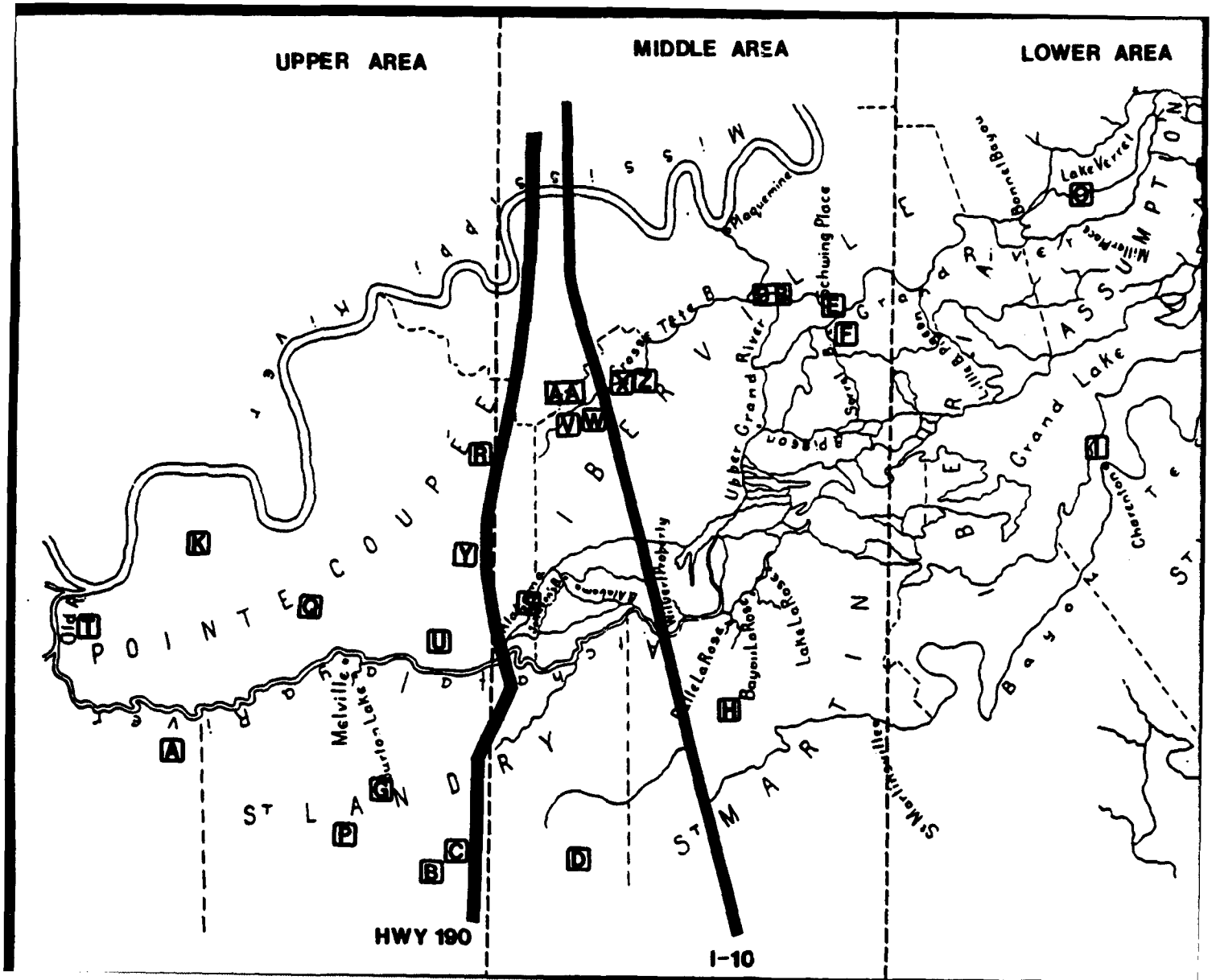
The Paleoindian Period

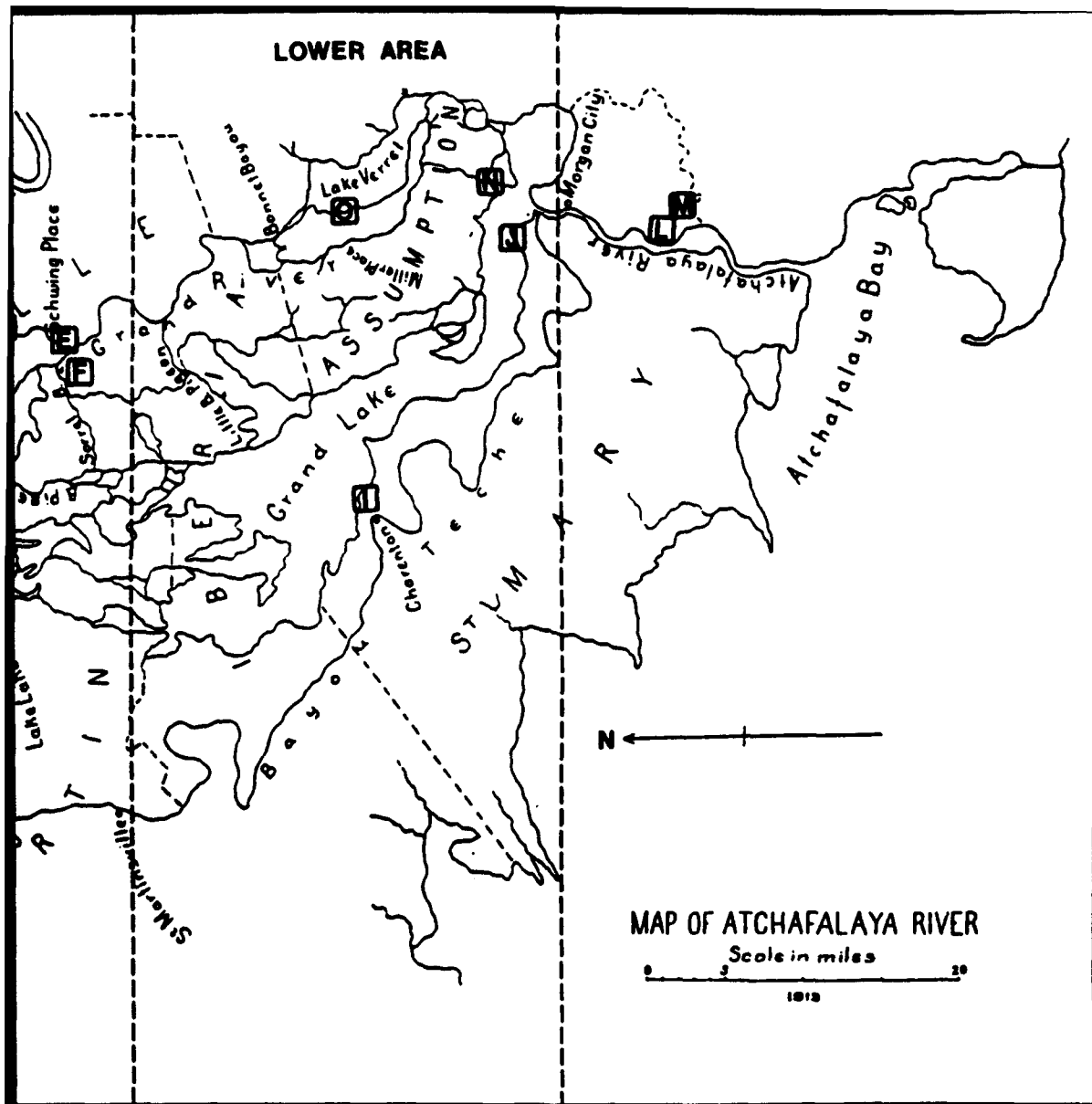
No Paleoindian sites or artifacts have been reported within the basin proper. However, projectile points have been found on Godeau Hill and Evergreen Island (no site numbers available at the State Division of Archeology) on the western edge of the modern basin. In addition, the George D. Guidry Site (16SL167), located between Arnaudville and Grand Coteau on the Pleistocene terrace, has also yielded Paleo-Indian lithic artifacts (Louisiana State Site Form; Mike Russo, personal communication 1994). The location of these sites is consistent with the peripheral model, which predicted that the very oldest sites would be located outside of the basin. While Paleoindian peoples were present in Louisiana, probably even in the area which became the basin, Jones and Shuman (1987) predicted that, "Yearly overflows and channel course changes of the Mississippi River have doubtless buried or washed away artifacts or other indications of that time" (Jones and Shuman 1987:7). If a Paleoindian site were discovered, the associated artifacts would date between 10,000 B.C. and 6,000 B.C., F

UPPER AREA

MIDDLE AREA

LOWER AREA





which even predates the Mississippi-Teche meander belt, and the site, consisting of a small temporary camp or kill site, would probably be found beside a water source (Neuman and Servello 1976:14).

The Archaic Period

Like the preceding Paleoindian Period, few sites have been reported for the Archaic Period. However, there does appear to be a significant increase, slight as it may be, of sites along the basin's edge, which is predicted by the peripheral model. According to Jones and Shuman (1987:7):

The succeeding Archaic or Mesoindian era dating from 8,000 B.C. to about 2,000 B.C. is underrepresented. It is probable that the highly exploitable environment of the Lower Mississippi Valley made this a good place to live.

But, according to Gibson (1982:79):

No Archaic components or sites have been properly identified in the basin proper, but do parallel the swamp margins atop the Mississippi alluvial valley walls themselves.

In other words, Archaic people lived on upland margins overlooking the interior but did not live in the lowlands of the basin proper (Gibson 1982:79-80). This might be expected in terms of age-area relationships: an association between old landforms which surround the basin and the occurrence of Archaic sites.

Smith et al. (1986:77) suggest that

The probability of locating Archaic (middle to late) sites is highest along natural levee crests of the early Teche distributaries in the Area West, Delta, and Western Terrebonne Marsh.

These three areas do represent some of the natural boundaries of the basin during prehistoric times. However, it should be noted that while peripheral sites may represent habitations, sites located within the basin proper might represent only short-term, resource exploitation sites. Nonetheless, no Archaic sites, either long-term or short-term, have been reported within the basin's interior. Furthermore, if Archaic sites did exist in the interior, all evidence for such sites has long been buried.

The Savage site (16AV68) is located along the older, elevated, Bayou Jack segment of the Teche-Mississippi meander belt course on the western edge of the northern area of the basin (Figure 8). Savage may represent a long-term habitation site based on stratified Archaic, Tchefuncte, and Plaquemine components (Gibson 1982:78). Neuman and Servello (1976:22, 43-44) reported two more sites (16SL16 and 16SL19) with Archaic components on the western side of the northern area of the basin, south of the Savage site.

Site 16SL16 is situated within the plow zone along a cultivated ridge on the south side of an improved parish road (Neuman and Servello 1976:43). The precise Archaic affiliation is unknown, as is the overall site size. Numerous projectile points

were found during a grab-bag surface collection (State of Louisiana Site Record Form). This may indicate that it is a short-term, resource exploitation site, but the site does fit the peripheral model in terms of its location.

Site 16SL19 is on an old natural levee of Bayou Courtableau. Its precise Archaic affiliation (early, middle, or late) is unknown. The overall size is 100 m in a north-south direction. Debitage was collected in a grab-bag surface collection, but no diagnostics were reported (State of Louisiana Site Record Form), which suggests, again, a temporary camp for the exploitation of natural resources or perhaps a lithic reduction station. Likewise, this site fits the peripheral model, regardless of its precise affiliation and usage.

Slightly east of 16SL16 and 16SL19, along the western edge of the northern area, Gibson (1982:79) reported a dense scatter of Archaic sites on the exposed natural levees of Big Darbonne Bayou (Gibson 1982:79). The bayou was reported to have been a major crevasse system of the Teche-Mississippi system (Gagliano et al. 1978 in Gibson 1982:79). Again, the location of these sites fit the peripheral model. No list of these sites was provided by Gibson (1982).

Another Archaic site (16SL12) was reported on the western edge of the middle area, a location again consistent with the peripheral model (Neuman and Servello 1976:42). The Archaic component may actually represent the Poverty Point Period, based on recovery of baked clay objects (Neuman and Servello 1976:22, 42). Furthermore, Gibson (1982:81) states that "To a lessening degree, sites and assemblages resembling Poverty Point components appear around Lafayette," an area which would include 16SL12 and which sits atop the Mississippi-Teche meander ridge.

On the eastern periphery of the basin, the only reported sites with Archaic components appear to represent Poverty Point occupations, a transitional period between the Archaic and succeeding Tchefuncte complexes. This designation is based on the recovery of baked clay objects found by C.B. Moore (1913:15) at two locations (16IV13 and 16IV4 on the southeastern side of the middle area). The Poverty Point Complex is thought to represent the period from about 2,000 B.C. to 1,500 B.C. for the whole of Louisiana (Manning et al. 1987:26; Jones and Shuman 1987:7).

Schwing Place (16IV13) is a mound site located on a natural levee on the southwest bank of Bayou Zeno (Jones and Shuman 1987:106-112). The site contains at least one low mound and possibly a second mound. The orientation of the second mound is problematic, and it may represent a natural anomaly on the ground surface (State of Louisiana Site Record Form; Moore 1913:15; Manning et al. 1987:80; Jones and Shuman 1987:106). Moore found 32 baked clay objects at the site, suggesting an association with the Poverty Point period (Moore 1913:15). However, these objects could be associated with the Tchefuncte component also reported at 16IV13 (Jones and Shuman 1987:107; State of Louisiana Site Record Form).

The Bayou Sorrel Site (16IV4) was located on a natural levee on the left descending bank of Bayou Sorrel (Gibson 1982:359). This site has at least one mound, which was excavated by Moore in 1913. There are reports of a possible second mound (State of Louisiana Site Record Form; Moore 1913:13-15; Manning et al. 1987:75-79). Moore (1913:15) recovered three baked clay objects from the mound. As was the case at 16IV13, these baked clay objects may have been associated with the Tchefuncte

component which was reported at this site (Gibson 1982:364; State of Louisiana Site Record Form).

Both the Schwing Place (16IV13) and Bayou Sorrel (16IV4) sites are important because they are associated with the eastern periphery of the basin. This area is associated with post-Teche distributaries (Smith et al. 1986:14), and thus only allows for the occurrence of cultures younger than Archaic. However, these sites are problematic because of the difficulties in distinguishing assemblages of late Poverty Point cultures from those of early Tchefuncte cultures. The landscape for both sites should coincide with the formation of the Mississippi-Lafourche meander belt, which dates from 2,000 to 500 years BP (Smith et al. 1986:39-40). This date would allow for the occupation of the area by either Poverty Point or Tchefuncte cultures.

On the northwestern edge of the basin, Gibson (1982:81) discussed the probability of Poverty Point components, stating that, "It is possible to ascribe Poverty Point components to Atchafalaya edge components, based on emphasis on trade goods and stretching typological criteria." The Stelly Mound group (16SL1) on Bayou Petite Prairie was proposed by Gibson (1982:81) to be a local center during Poverty Point times, but no artifact listing was provided. On the Louisiana State Record Form, the site is reported to consist of three mounds on a natural levee. Various diagnostic points and other artifacts were recovered, including Poverty Point objects (Louisiana State Site Record Form).

Although previous research at the Stelly Mound group indicates that the mounds were occupied during the Poverty Point, Tchefuncte, Coles Creek, or Plaquemine periods, new evidence recovered by Mike Russo and a team of volunteers indicates that construction of the mounds may actually have begun in the Pre-Poverty Point Archaic. Carbon 14 dates were obtained from a hearth in Mound B, and a date of 4720 ± 190 years B.P. was assigned to the hearth. This would place Mound B in the Meso-Indian/Archaic age, making the site one of the oldest ceremonial mounds in North America (Russo 1993:20-21). Artifacts recovered from the Stelly Mound group analyzed by James A. Fogleman (1994) support the Carbon 14 dates obtained by Russo. Most of the artifacts recovered date to the Poverty Point and Pre-Poverty Point Archaic. However, a few later artifacts indicate that a brief Coles Creek occupation occurred at the site. Mound B contained no post-Archaic artifacts (Fogleman 1994:25). Testing on Mound C has since been conducted, but results were not available at the time of this report.

Two other sites located on the northwestern edge of the Atchafalaya Basin exhibit Poverty Point components. These are 16SL11 and 16SL18. Site 16SL11, the Courtableau Mounds, are located northwest of the Atchafalaya Basin on a natural levee. Two mounds have been noted at this site. A third mound formerly may have been present at the site, but it was not visible as of 1991 (Jones and Shuman 1991). The Courtableau Mounds have been severely disturbed by plowing and associated erosion; however, surface collections indicate that the site has deposits dating to the Poverty Point, Tchefuncte, and historic periods (Louisiana State Site Form).

16SL18, the Meche-Wilkes Mound, is located near Arnaudville on the periphery of the Atchafalaya Basin on the edge of the Pleistocene terrace. This site has been protected by the landowner and is relatively undisturbed. Gibson conducted excavations at the Meche-Wilkes Mound in 1990. The site contains deposits dating to

the Poverty Point, Tchefuncte, Baytown, Plaquemine, and historic periods (Louisiana State Site Form).

The Tchefuncte Period

The generally accepted dates for the Tchefuncte Period range from 550 B.C. to A.D. 200 (Jones and Shuman 1987:7; Neuman and Servello 1976:16-17; Manning et al. 1987:26-27). It has been suggested that Tchefuncte sites within the basin can be classified as

...inland sites focusing on river terrace and flood plain habitats of the Lower Mississippi Alluvial Valley, and coastal plain sites focusing on utilization of coastal and deltaic ecosystems on the Mississippi River deltas and Gulf Coast [Manning et al. 1987:27].

Like Archaic sites, Tchefuncte sites are usually found on natural levee crests of major river meander belts. None have been reported in the pure swamp area, but they do exist near the upland margins of the basin (Gibson 1982:82). Site location once again appears to be consistent with the basin periphery model, predicting higher densities on the eastern and western edges of the basin. There is an increase in the number of Tchefuncte sites relative to Archaic sites, which suggests an expansion of population and movement of peoples up and down escarpment edges and along conjoined meander belt ridges (Gibson 1982:81).

Sites with Tchefuncte components which best represent this pattern include 16IV4 (Bayou Sorrel Mounds) and 16IV13 (Schwing Place) in the southeastern part of the middle area, and 16AV68 (Savage) on the western edge of the northern area. Gibson (1982) also noted that the density of Tchefuncte sites along the western edge of the basin in the southern part of the northern area is greater than that in the middle and southern areas. In the middle and southern areas, the density is lower and sites are more scattered. Tchefuncte sites reported in this area include Bayou Perronet (16SM50) in the eastern part of the middle area and Charenton Beach (16SMY2) in the middle part of the southern area (Gibson 1982:79).

Bayou Perronet, or Bumblebee (16SM50), is a small "black earth midden" situated on the right descending bank of Bayou Perronet near Henderson, west of the West Atchafalaya Basin Protection Levee (WABPL) (Gibson 1982:459-473). The site, stretching for 40 meters along the bank, is composed of a stained-earth midden with *in situ* materials (Louisiana State Site Record Form). Gibson (1982:90) believes that "the site is a short term village/camp occupied totally within the Tchefuncte period."

Charenton Beach (16SMY2) is a midden site on the beach of the western shore of Grand Lake, along the eastern flank of the Teche Ridge (Gibson 1982:450-459). The site consists of five shell mounds, some of which are reported to contain burials (State of Louisiana Site Record Form; Moore 1913). This site appears to represent one of the late Tchefuncte sites discussed by Gibson (1982:81) as being situated on "...landforms lying out in the swamp at some distance from the higher elevations provided by the meander belt ridges and the upland margins." This would suggest that as cultures expanded over time, they slowly moved off the older landforms and out into the bottom lands of the basin itself.

According to Gibson (1982:426), another site that represents occupation of the lowland areas is the Moccasin site (16SMY104). This prehistoric shell midden is just northwest of present-day Morgan City, on a natural levee of Riverside Pass (Gibson 1982:424-437; Neuman and Servello 1976:30, 67). It should be noted that Neuman and Servello (1976:67) make no mention of this site containing a Tchefuncte component. This site is associated with the lake systems in the southern part of the basin, which began forming with the closure of the Atchafalaya Basin by the Lafourche deltaic network approximately 1,500 to 2,000 (Smith et al. 1986:44). Smith et al. (1986:44) estimated that the lake system required at least several hundred years to form, and this would allow the landscape to be populated by the Tchefuncte cultures.

The Deep Pot Site (16SL126) and the nearby Dusty Road Site (16SL125) are buried middens exposed by road cuts and ditches south of Bayou Petite Prairie, in the western portion of the Upper Basin Area. These are the only Tchefuncte sites identified along Bayou Petite Prairie. The midden at the Deep Pot Site is located within Red River Gallion soils, apparently lying between two alluvial events. Eight test units were excavated at the site as a 2 x 4 m excavation area in 1992. The units revealed a Tchefuncte midden running more than two meters northwest-southeast, below 30-40 cm of Red Gallion soils. The midden may run parallel to a relict channel course. Over 1200 Tchefuncte sherds were recovered from the Deep Pot Site, as well as lithics and fishbones (Russo 1992:30-33; Russo 1993:26).

The Baker Site (16SM19) is located on the banks of Bayou Fusilier of the Swamps, near the western edge of the Atchafalaya Basin (in the Middle Area). Considerable confusion exists in the site records as to the identity of this locale, but a review of the evidence by Mike Russo indicates that this was a multi-mound site of which one mound survives. During a survey and testing program conducted by Russo in 1992, dark midden with large amounts of bone, charcoal, and freshwater shell was located at depths of up to 1 m below surface. A 50 x 100 cm test unit was excavated to a depth of 60 cm, and yielded over 2000 Tchefuncte sherds (Russo 1993:37-40).

Tchefuncte sherds constitute the predominant ceramic material at the Hicks Site (16SL4), Keller Lake Site (16SL154), X Site (16SL155), and Magenta West Site (16SM47), described in Russo (1992), and at the Straw Lake West Site (16SL115) described in Russo (1993). Tchefuncte components are present at the Slow Bend Site (16SL124), BC² Site (16SL132), Bayou Little Teche Site (16SL139), and the Hamilton Site (16SL140) described by Russo (1992), and at the Olivier Site (16SL12), Talley Mounds (16SM71), probably Indian Hill (16SM77), and the North Bend Site (16SMY132) described by Russo (1993). The North Bend Site includes Tchefuncte shell midden as well as a historic component; it lies along the Intracoastal Waterway outside the Atchafalaya Basin, on a distributary channel of Bayou Teche.

The recovery of buried midden at the Deep Pot Site and elsewhere indicates that other deeply buried Tchefuncte sites may be found within the Atchafalaya Basin, but their discovery largely depends on accidental exposure during nonarcheological excavation. The probability of encountering completely buried Tchefuncte (or earlier) sites during archeological survey is slight. In some areas, such as along Bayou Petite Prairie, it may be possible to predict the association of Tchefuncte sites with geologically identifiable alluvial events.

The Marksville Period

The general time frame for the Marksville period ranges from 100 B.C. to A.D. 400 (Manning et al. 1987:27; Jones and Shuman 1987:7). Few sites representing this period have been reported within the basin. Gibson (1982) reported only one ceramic sherd exhibiting a Marksville cross-hatched rim mode. It was recovered from the Bayou Perronet site (16SM50). After his 1982 survey of the basin, Gibson felt that the Marksville period in the Atchafalaya Basin could be

...viewed as nonparticipant or attenuated participation by local populations in activities that gave that particular Marksvillian flavor to the material cultural complexes of the day [Gibson 1982:82].

However, the sites 16IV4, 16IV13, and 16SMY2, which were listed as having Archaic and/or Tchefuncte components, were also reported to have yielded artifacts that are representative of Marksville culture (Manning et al. 1987:28; Jones and Shuman 1987:69, 107; Gibson 1982:450-459).

There are also three other sites which yielded Marksville-type artifacts, principally ceramic sherds. The three sites are Monk's Mound (16PC5), located on the eastern side of the northern area; and Bone Point (16SMY39) and Oak Chenier (16SMY49), both of which are located south of Morgan City. These sites fit the peripheral model in that they demonstrate the movement of more recent cultures off the older ridges on the basin's periphery and out into the lowlands of the basin's interior.

The Monk's Mound site (16PC5) is located on a natural levee east of Bayou White Vine, 0.8 miles south of Racourci Old River in Pointe Coupee Parish in the northern area. It is a typical conical mound with Marksville ceramics in clear association with the mound (Jones and Shuman 1987:7, 145-150; State of Louisiana Site Record Form).

The Bone Point site (16SMY39) is located on a natural levee on the right descending bank of Bayou Shaffer at the former junction of Bayou Shaffer and Bayou Penchant in the southern area. Gibson reported that the cultural materials were not *in situ*, and that the shell midden was a recent development (Gibson 1982:410-412). It should be noted, however, that the state site form indicates a cultural affiliation of Troyville and Coles Creek with no *in situ* materials or mention of Marksville artifacts (State of Louisiana Site Record Form).

Oak Chenier (16SMY49) is a *Rangia*/earth midden located on the right descending side of Bayou Chene on the south shore of Avoca Island Lake in the southern area. This site was recorded by Gibson (1978:127-132), and its assemblage is reported to contain Marksville ceramics. However, the state site form lists the cultural affiliation as Troyville and Coles Creek with no reference to a Marksville component (State of Louisiana Site Record Form).

The review presented here demonstrates that workers in the basin have reported conflicting data concerning the presence or absence of a Marksville occupation in the Atchafalaya Basin. An example of this is the discrepancy between the Bone Point (16SMY39) and Oak Chenier (16SMY49) site forms completed by Gibson and his (1982) survey report for the Atchafalaya Basin. Pending obtaining absolute dates

and/or more artifacts from excavated contexts, Gibson's (1982) discussion of the paucity of diagnostic Marksville artifacts is intriguing, especially considering the proximity of the basin to the Marksville type site (16AV1). Perhaps Gibson is correct that the basin was occupied during this period but that the inhabitants used and produced few diagnostic artifacts. Alternatively, the basin may have been largely abandoned during this period. Regardless of this, it should be noted that these sites are located in areas that are younger than the ridges surrounding the basin, which is consistent with the expectations of the peripheral model.

The Troyville-Baytown Period

Archeologists in southeastern Louisiana have often discussed the difficulty of differentiating "Troyville" from "Baytown" (e.g., Louisiana Archaeology 1982). It seems reasonable to refer to the years from ca. A.D. 300-700 as the "Baytown Period" as is done by researchers affiliated with the Lower Mississippi Valley Survey (e.g., Phillips 1970). In this usage, the "Troyville Culture" is characterized as the culture of peoples occupying an undefined geographic area during the Baytown Period. Gibson (1982), however, raises an additional problem concerning the Atchafalaya Basin. While the terms "Troyville" and "Baytown" can easily be applied within the basin, the forms connote material complexes or artifact assemblages associated with Troyville and Baytown which are not present there nor within conjoined coastal environments. As was the case for the Marksville Period, the apparent paucity of diagnostic Baytown artifacts creates a problem that can be addressed only through additional excavation and by obtaining absolute dates.

There does seem to be a population increase during the period A.D. 400-700 (Gibson 1982:83). Evidence for this increase is the number of sites that were initially occupied during the Troyville-Baytown Period. Also, many of the previously mentioned multi-component sites contain either Troyville or Baytown components. The sites discussed by Gibson as either Baytown or Troyville, based on recovered ceramics, include 16IV4 (Baytown), 16SMY39 (Baytown), 16SMY104 (Troyville), 16SMY49 (Baytown or Troyville), (Gibson 1982:362-374, 410-412, 424-437; and 1978:127-132). Jones and Shuman (1987:106-112) discussed the presence of a Baytown component at 16IV13. Some of the sites which appear to have been first occupied during the Baytown Period are Belle River Landing (16SM6?), Nutgrass (16SM45), Fish Bayou (16SL61), and 16PC17. These sites are located further away from the older ridges surrounding the basin, which is consistent with the peripheral model for site location and age.

The Belle River Landing site (16SM6?) was discovered during the transport of *Rangia* shells for a public boat landing on the Port Allen-Morgan City Intracoastal Canal and on the western berm of the EABPL in the southern area. Gibson reported this site in his 1982 survey report. However, there were problems determining which of three sites in the area was the origin of the *Rangia*. Therefore, Gibson added a question mark to the site number. Baytown-associated artifacts were found within the *Rangia*, so perhaps one of the sites in the area included a Baytown component (Gibson 1982:379-390).

The Nutgrass site (16SM45) was located on the bank of the Port Allen-Morgan City Intracoastal Canal about 1.9 km south of the Belle River Landing site. This shell midden was first reported by Neuman and Servello in 1976 and then revisited by

Gibson in 1982. Neuman and Servello suggested that the site contained Troyville and Coles Creek components (Neuman and Servello 1976:27, 54-55; State of Louisiana Site Record Form). Gibson, however, collected no artifacts and based his observations on the Neuman and Servello report (Gibson 1982:396-399).

The Fish Bayou site (16SL61) was located on a natural levee crest on the south bank of Fish Bayou at the junction of the Bayou des Glaisses Diversion Channel on the western side of the northern area. The site was recorded by Gibson in his 1982 survey and was reported to contain Baytown artifacts. However, Gibson (1982:483-489; State of Louisiana Site Record Form) thought this site represented a small Coles Creek hamlet, and that the "Baytown" ceramics may have actually derived from an early Coles Creek component. The fission-fusion model may be applicable for this site. As stipulated by Gibson, the site may represent a hamlet, which may suggest that it was established by a group which broke away from some larger village site in the area. This might be substantiated if a larger village site of a similar date could be documented in the area. At present, though, no such village site has been identified.

16PC17 is a site which was located on a natural levee of Bayou Black at its juncture with Bayou Cross Vine in the northern area. The site was confined to the A-zone soil and had been greatly disturbed. It was recorded and reported by Neuman and Servello (1976:23, 37).

The Coles Creek Period

Population density in the Atchafalaya Basin reached its peak during the Coles Creek Period (Gibson 1982:93). This assertion is based on the large number of sites containing Coles Creek components. This population growth and areal expansion are believed by some (e.g., Manning et al. 1987) to be a possible result of increased reliance on maize agriculture (Manning et al. 1987:29) which in turn suggests an increase in cultural complexity. Manning et al. (1987:29) further propose that "seasonal exploitation of coastal environments supplemented the maize economy of large inland sites and small non-mound farmsteads were present." This fits the fission-fusion model of settlement patterning.

As previously discussed, Gibson (1982) believes that occupants of the upper portion of the Basin engaged in full-fledged horticulture within permanent villages. However, in the middle portion of the basin, horticulture probably never was practiced due to the threat of flooding. In the southern portion, the settlement pattern appears to be one of group fission, with marsh/bay residence in spring and summer. In the fall and winter, the pattern appears to be one of group fusion with the occupation of inland sites (Gibson 1982:93-94).

In the upper or northern basin and in the middle area, Gibson (1982:85) discussed a village fission settlement pattern consisting of a large village with smaller residential hamlets of a few families budding off from the main village. Examples of village sites which fit this model include Bayou Sorrel (16IV4) in the eastern part of the middle area and Charenton Beach (16SMY2) in the western part of the southern area (above). An example of a site representing a hamlet may be Fish Bayou (16SL61; above) in the western part of the northern area (Gibson 1982:94).

Other sites in the northern and southern areas that contain Coles Creek components, and which have been discussed above, are 16PC5, 16SM6?, and 16SM45 (Neuman and Servello 1976:22-23; Gibson 1982:379-391, 396-399). It is unclear whether these sites represent the village fission pattern discussed by Gibson (1982). However, these sites do represent the possibility of fission-fusion settlement, and they do fit into the peripheral model as previously discussed.

In the southern portion of the basin, Gibson (1982:85) used the fusion-fission model to illustrate seasonal adaptive settlement patterns. However, neither Gibson (1982) nor Manning et al. (1987) mention specific sites which represent examples of their model of site distribution and settlement patterning. Sites containing Coles Creek components and which were discussed above include 16SMY39 and 16SMY49 on the east side of the southern area, and 16SMY104 on the west side of the southern area.

Coles Creek sites which have not been discussed previously include 16PC1, 16PC2, 16PC7, and 16PC8. All of these sites are located in the upper or northern area of the basin within Point Coupe Parish. The Livonia mounds (16PC1) are located on a natural levee on the eastern bank of Bayou Grosse Tete (Jones and Shuman 1987:131-138). The site consists of two or three mounds distributed over a 20-acre area which may have been a large village site, however, this is speculative and not substantiated. Two of the mounds are aligned on an east-west axis (State of Louisiana Site Record Form).

Mound Bayou Mound (16PC2) is a mound site on a natural levee 150 feet west of Mound Bayou. The site consists of a single platform mound with a circular shape and a diameter of about 190 feet, and it stands about 4.4 feet high from the base to the summit (Jones and Shuman 1987:138). According to Jones and Shuman (1987:138), "...the mound is presently covered by trees, of which some are sizable and some secondary growth. Also, the western side of the mound appears to have been silted somewhat by an increase of drainage away from the levee along the Atchafalaya River." Jones and Shuman (1987:139) recovered "...five aboriginal sherds which corroborate Neuman and Servello's assigning a Coles Creek occupation to the site, and no artifacts were found on the surface around the mound to indicate a surrounding midden area." It was also stated by Jones and Shuman (1987:139) that the site seems to be frequently inundated, which probably resulted in a heavy silt deposit that would bury any indications of middens and midden material or artifacts. However, Neuman and Servello (1976:22) reported this site to be composed of an isolated mound with an associated midden. On the Site Record Update Form, Jones and Shuman mention a possible Troyville component as well as the Coles Creek component. It is possible that this "Troyville" component may actually represent an early Coles Creek occupation (Jones and Shuman 1987:138-144; State of Louisiana Site Record Update Form). The location of this Coles Creek site within the interior of the basin is consistent with the expectations of the peripheral model. Also, this site may represent a hamlet because it has only one mound. This is speculative, however, and future excavations of isolated mound sites may help to understand their function.

Lettsworth Bayou (16PC7) is a mound site with associated middens on each side. Neuman and Servello reported its Coles Creek component (Neuman and Servello 1976:22, 34; State of Louisiana Site Record Update Form). Bayou Gerance (Bayou Gerance East or Bayou Gerance I [16PC8]) is a midden site situated on both banks of Bayou Gerance, and it also includes a Coles Creek component. The site is on a natural

levee and has no visible midden (State of Louisiana Site Record Form). It was reported by Neuman and Servello (1976:22, 34) to include a Coles Creek component. Its location is consistent with the peripheral model as a more recent manifestation in the basin's interior.

Three sites with Coles Creek components are situated on the natural levee of Bayou Grosse Tete. These sites are 16IV1, 16IV2, and 16IV20. The Rosedale Plantation site (16IV1) is located two miles north of the city of Rosedale. This site includes a platform mound ten feet high atop a natural levee. The cultural deposits were first recorded by Kniffen in 1937, and the deposits have yielded artifacts representative of the Coles Creek through the antebellum period (State of Louisiana Site Record Form; Kniffen 1938:191, 199-201; Jones and Shuman 1987:50-55).

The Peter Hill site (16IV2) is located on a natural levee on the east bank of Bayou Grosse Tete, nine miles south of Slacks. The site was first recorded by Kniffen in 1938. It contains Coles Creek through protohistoric assemblages, and it has two platform mounds (State of Louisiana Site Record Form; Kniffen 1938:191, 199-201; Jones and Shuman 1987:56-68).

Mt. Olive Cemetery (16IV20) is located on a natural levee on the west bank of Bayou Grosse Tete, about 1000 feet south of I-10. The site consists of a single low temple mound with a Coles Creek component as well as a historic/modern cemetery at the foot of the mound (State of Louisiana Site Record Form; Kniffen 1938:191; Jones and Shuman 1987:113-119). Because this site is composed of a single mound like 16PC2, it could represent a small hamlet.

The Mississippi Period/Plaquemine Culture

The Plaquemine Culture, which developed out of Coles Creek in the Lower Mississippi Valley, seems to represent the zenith of the Mississippi Period in Louisiana. The dates are generally considered to be from ca. A.D. 1100 to A.D. 1700 (Neuman and Servello 1976:19). Assemblages from the Atchafalaya Basin do not exhibit "Mississippian" traits, but they are representative of the Plaquemine Culture which characterized southern Louisiana during this period. There are in the basin a wealth of sites and artifacts that have been associated with the Plaquemine Culture. The majority of these sites also include earlier components which have been discussed above.

Those sites previously discussed include 16PC2 (northwest part of the middle area of the basin); 16PC8 (southeast part of the middle area); 16IV1, 16IV2, and 16IV4 (eastern edge of the middle area); 16SMY2 (western edge of the southern area); 16SMY104 (northwest of Morgan City in the southern area); 16SL12 (western edge of the middle area); and finally, 16AV68 (northwest edge of the northern area).

There are three additional Plaquemine sites along the eastern edge of the basin which have not been previously discussed. These sites are 16PC3, 16IV5, and 16IV7. The Bayou Close site (16PC3) is located along the west bank of Bayou Gerance in the southern part of the northern area. The site is on a natural levee, and at one time consisted of a *Rangia* midden and possibly two low mounds. The Site Record Form reported that the site may include both the Coles Creek and Plaquemine components,

and it appears to represent a small hamlet or village (State of Louisiana Site Record Form). This site might therefore fit the fission-fusion model of settlement.

The Reed Mounds site (16IV5) is located on a natural levee of Bayou Grosse Tete. The site is reported to consist of one large platform mound and two smaller mounds paralleling the bayou. The cultural components were recorded as Plaquemine and historic (State of Louisiana Site Record Form; Kniffen 1938:196, 202, 204).

The Mays Place Camp site (16IV7) is located on the west bank of Bayou Grosse Tete. The site is situated on the natural levee and consists of a three-foot-high platform mound. The cultural components were recorded as Plaquemine through antebellum (State of Louisiana Site Record Form; Kniffen 1938:191).

Historic Tribes

The understanding of the migration of historical tribes through the Atchafalaya Basin is based primarily on ethnographic documents and reports of the early explorers in the region rather than on archeological research. There were three tribes that were documented as having migrated through and/or having lived within the Atchafalaya Basin. These tribes are the Chitimacha, the Houma (Gibson 1982:88-89), and the Bayougoula (Manning et al. 1987:30).

The Bayougoula, among others, were reported during contact times to be living along the peripheries of the basin, and "Due to the continuing pressure from the European Colonists, they were probably forced to occupy larger areas of the swamp" (Manning et al. 1987:30). In 1699, Pierre Le Moyne, Sieur D'Iberville, and his brother, Jean Baptiste, Sieur De Bienville, made contact with the Bayougoula in the swamps and bayous adjacent to the Mississippi River (Manning et al. 1987:30). On March 14, 1699, they worked out a treaty with the chiefs of the Bayougoula and the Mougoulasha, who were sharing the settlement. Iberville reported that most of the women had died as a result of small pox (Manning et al. 1987:30-31). Apparently, the Bayougoula were massacred after Iberville and his brother went back to France (Manning et al. 1987:31). No archeological evidence of the Bayougoula or the Mougoulasha has been reported within the Atchafalaya Basin.

According to Manning et al. (1987:31), the most prominent tribe in the eastern portion of the basin was the Chitimacha, but "due to their hostility, not much had been documented by European visitors to the region" (Manning et al. 1987:31). Before the 1700s, the Chitimachas moved north from the southern portion of the basin to Bayou Plaquemine (Manning et al. 1987:31). Then they moved across the basin to the western branch of the Chitimacha Lakes (now Grand Lake) and along Bayou Teche (Gibson 1982:86). According to Gibson (1982:86),

...There is an east-west water route in the middle of the basin, joining the Grand Lake village sites to villages along Bayou Plaquemine, Grosse Tete, and Jacques, with village sites along the way.

Swanton reported that

...The Chitimachas remained at Bayou Goula, in Iberville Parish, through 1721, and in a 1766 census, there were recorded only 22 people living below Plaquemine [Swanton in Manning et al. 1987:31].

Village sites have also been reported at Plaquemine, Indian Village (16IV158), Belle River, and Donaldsonville (Manning et al. 1987:31).

During much of the European contact period, the Houma were residing on the east bank of the Mississippi River in the vicinity of Pointe Coupee (Gibson 1982:89). Due to European intrusions into the area, the Houma migrated south, picking up remnants of the Bayougoula, Acolapissa, Quinipissa, and Mugulasha. They settled in the vicinity of present-day Houma. Unfortunately, few sites representing these various groups have been reported in the Atchafalaya Basin (Gibson 1982:89, 105).

Summary and Conclusions

The chronology contained within this report was primarily based on the archeological data available from the Louisiana Division of Archeology. The data consisted of site reports, survey reports, and artifact (primarily ceramic) typologies. An attempt was made to synthesize this data into a settlement model for the Atchafalaya Basin.

The concept of age-area relationships was utilized to examine site location relation to the landscape in which the site is found. This was accomplished through the application of a peripheral model and a fission-fusion model for settlement patterning. By examining the locations of known sites in light of the above-mentioned models, it was confirmed that the maximum age of a given site can be to some extent predicted by the age of the landscape containing that site.

It was noted that the highest probability areas for archeological sites are located on the natural levees of extinct and extant distributaries in and around the basin. This is due both to a preference for settlement of these areas as well as an artificial bias resulting from heavy sedimentation of the surrounding terrain. Similarly, the probability of discovering pre-Coles Creek sites is lessened due to the high sediment rate within the basin proper. Despite this, it was also noted that the natural levees of older distributaries may contain the gamut of prehistoric occupations, excepting Paleoindian sites.

Neither Archaic nor Tchefuncte sites are very prevalent in the eastern areas of the basin, but they are instead located along the older landforms flanking the west side basin proper. The east side seems to have the highest concentration of Coles Creek and Plaquemine sites. However, the population during these periods was thought to have been the largest ever residing in the basin. Thus, Coles Creek and Plaquemine sites are found dispersed throughout the basin. The fission-fusion model helped to clarify the relationship of village sites to seasonal exploitation sites in the southern areas of the basin. In the middle and upper basin, this model predicts a pattern of large villages surrounded by smaller hamlets, all of which subsisted on a horticulture-based diet.

CHAPTER 5 HISTORIC OVERVIEW by Benjamin Maygarden

The Study Area To 1865

At the beginning of the historic period, the region encompassing the survey parcels was inhabited by the Chitimacha tribe, who may have derived their appellation from their own name for Grand River. The territory of the Chitimacha at the end of the seventeenth century included the lower Teche, Grand Lake, Grand River, and the area between Grand River and the Mississippi. A village of the Chitimacha called Shetinamu was identified by Swanton (1952) as having been located on Grand River west of Plaquemine, above the survey parcels. Numbering approximately 3,000 individuals in 1650, the Chitimacha were a powerful tribe in the region (Swanton 1952:202-203). However, contact with the French brought about a decline in the Chitimacha population. After a party of Chitimacha slew a French missionary priest in August 1706, the French were at war with the Chitimacha until 1718. Many of the tribe were enslaved. In 1758, the Chitimacha residing near the Mississippi numbered only about 80 warriors, and by 1784, only 27 warriors survived (Swanton 1952:203). Historic maps indicate that the settlement at the confluence of Bayou Grosse Tete and Bayou Plaquemine has been called Chetimachas and Indian Village (Figure 9) since the antebellum period.

It was not the antipathy of the Chitimacha but rather the difficulty of access to the interior of the Atchafalaya Basin, and quantity of excellent agricultural lands elsewhere, that prevented significant settlement in the area during the French and Spanish colonial periods. The French were certainly aware of the more obvious resources of the Atchafalaya Basin, as Le Page Du Pratz in his *Histoire de la Louisiane* quoted F. Charlevoix as stating "large vessels can go to the lake of the Chetimachas [Grand Lake], and nothing hinders them to go and cut the finest oaks in the world, with which all that coast is covered" (F. Charlevoix quoted in Le Page du Pratz 1774:vi). However, the Atchafalaya Basin in the eighteenth century was more often seen as an obstacle to east-west traffic than as a region to be exploited. In 1770, the channel of Bayou Plaquemine was cleared and deepened to facilitate water passage from the Mississippi by way of Grand River and Grand Lake to Bayou Teche. Bayou Plaquemine remained a major route into the Atchafalaya Basin into modern times (Comeaux 1972:9). Grand River itself was often considered the main channel of the Atchafalaya by early writers and map-makers.

Thomas Hutchins described the Atchafalaya in 1784:

The [head of the] Chafalaya is about 30 miles above the settlement of Pointe Coupee, and three miles below the mouth of the river Rouge. It is the uppermost mouth of the Mississippi, and after running many miles through one of the most fertile countries in the world, falls into the bay of St. Bernard [Atchafalaya Bay], a considerable distance westward of the mouths of the Mississippi... In descending the Chafalaya it is three miles from the last mentioned island [Alabama Island] to Isle au Vauche [Cow Island]; and to the Bay de Chafalaya [?], which is on the eastern side of the river, it is three miles more. This bay is of a triangular figure, about six miles in length, and something better than a mile in



Scale, One Inch = 6 Statute Miles.



Figure 9. Excerpt from map by E. Schulz (1915) showing the study area and the location of Indian Village. The survey parcels are indicated, north to south, Item E-64, Item E-76, and Item E-84a (Louisiana Collection, Tulane University).

width at its entrance. When the Chafalaya is not raised with freshes, there is seldom more than five feet water in this bay. Fifteen miles from it on the eastern side, is the Bay of Plaquemines. About half the distance between these bays, is a rivulet [Bayou Maringouin] which communicates with the former bed of the Mississippi, back of Pointe Coupee, during the annual floods in that river. The country between them is very low, swampy, and full of ponds of water.

Near the source of the Chafalaya the current is very rapid, but gradually diminishes to the mouth, where it is very gentle.

We will now return to the Isle au Vauche, and proceed from thence to Lake de Portage [Lake Mongoulois and Lake Chicot], which is three miles from the island. This lake is 13 miles long, and not more than one and an half broad. It communicates at the southern end, by a strait a quarter of a mile wide, with the grand lake of Chetimachas [Grand Lake], which is 24 miles in length and 9 in width. The country bordering these lakes is low and flat, and timbered principally in cypress, some live and other kinds of oak; and on the eastern side, the land between it and the Chafalaya River [i.e., Grand River], is divided and again subdivided by innumerable small streams, which occasion as many islands. Some of these streams are navigable.

At a little distance from the southeastern shore of the lake Chetimachas, is an island where persons passing that way generally halt as a resting place. Nearly opposite this island, along the western shore, there is an opening [Berwick Bay] which leads to the sea... [Hutchins 1784:45-46]

Hutchins also noted that lands lying to the west of the Atchafalaya Basin were already extensively occupied by French, Acadians, Canary Islanders, and even some English settlers. "They raise large stocks of black cattle... when fat enough for sale, which they commonly are the year 'round, [they are] driven across the country to New Orleans, where there is always a good market" (Hutchins 1784:45-46). By the 1770s, the districts of Opelousas and Attakappas already had 10,000 cattle and 2,000 horses. Native Americans, slaves, and settlers of European descent on horseback and in pirogues drove the cattle, sometimes in herds of hundreds of animals, across the Atchafalaya Basin to eastern markets. The animals swam or were ferried across the bayous that laced the region. If destined for the Mississippi River settlements or New Orleans, the cattle were driven to Bayou Plaquemines; if going to the Natchez area, the herds were driven up the Atchafalaya (Usner 1993:180-181). A map of Louisiana by M. Ludlow (1817) (Figure 10) shows a drover's road crossing the Atchafalaya at Cow Island and following the course of Grand River to Bayou Plaquemine, and then to the Mississippi River.

C.C. Robin traveled on Grand River and the Atchafalaya at the end of the colonial period. He entered the river from Bayou Plaquemine and provided this florid account:

...The bayou breaks up into innumerable channels, as it flows along, in which one is easily lost if he is not familiar with them. Sometimes, the channel enlarges into lakes, sometimes it narrows suddenly and one finds

oneself in shadowy avenues, overhung with enormous trees, impenetrable by the rays of the sun, interlaced with dense vines, and loaded with grayish streamers of Spanish moss, barely leaving room for the passage of the boat. One imagines himself crossing the shadowy Styx with Acheron. Alligators in swarms, surround the travelers or are seen sleeping everywhere on the shell beaches. Mixed with the deep throated bugling of giant frogs... [are] the sharp cries of black cormorants and the melancholy love note of the owls.

After long sinuosities which form innumerable islands, among which the inexperienced traveler would require the thread of Ariadne in order not to wander forever, the river opens suddenly into a magnificent lake of several leagues extent. The sudden light surprises the traveler and the beauty of the water, set about with tall trees, forms an enchanting sight.

These tall trees are cypresses. Stretching away from us as far as the eye can see, each cindery column, based upon a broad, deeply furrowed cone, crowned with branches which hardly bend down at all. These columns seem to form the portico, and one fancies that he is before the immense palace of the God of the Waters. The mysterious lair of Old Proteus....

From this lake, called Lake Natchez, one enters still more winding and complex channels, which traverse the extremity of a much larger lake, called Grand Lake, and entering the shadowy and narrow channels once more, one comes finally to the Atchafalaya... [Robin 1966:184-185]

Major Amos Stoddard (1812), identified the Atchafalaya as the natural border between the "Delta" region of Louisiana and the "elevated country" of the Attakappas and Opelousas. After describing the series of rafts obstructing the Atchafalaya between its head and Cow Island, Stoddard continues:

...At Cow island the stream is divided; one part spreads into a large lake; the other part [i.e. Grand River] continues its course, and seems to maintain its usual breadth and depth. The current of the Chafalia [Grand River] is gentle till it is joined by the Plaquemines about one hundred and fifty miles from the outlet on the Mississippi, where its velocity is considerably increased. It communicates with Lake Natchez by means of several bayous, most of which are navigable in the season of high water. Grand lake is about forty miles long, and from three to ten miles wide, into which the Chafalia is emptied by a channel of about two hundred and fifty yards wide; and a depth of nearly forty feet. It then passes through Berwick bay....

...The most convenient navigation to New Orleans [from the Attakappas] is by means of the lower part of the Chafalia, Plaquemines, La Fourche, and the Mississippi [Stoddard 1812:179, 181].

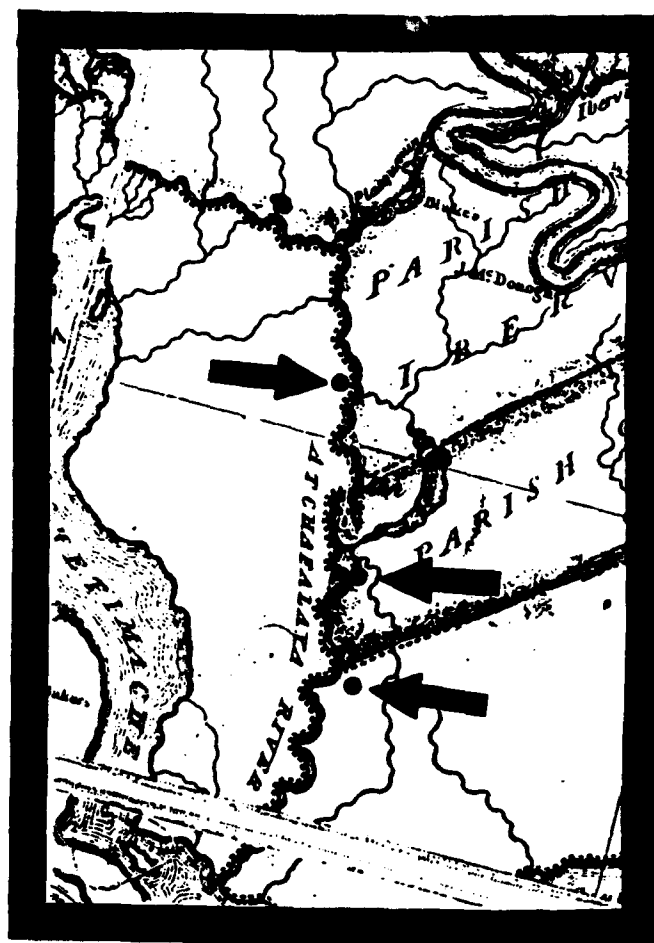
Stoddard's statement of the most convenient water route from the Attakappas and Bayou Teche included the portion of Grand River between Six Mile Lake, at the southern end of Grand Lake, and Bayou Plaquemine. Furthermore, between 1806 to

1809, the Attakappas Canal was constructed from Bayou Lafourche to Lake Verret, offering an alternative route between the lower Atchafalaya and Lake Palourde to the Mississippi (Prichard et al. 1945:754). Stoddard and others by this period were also well aware of the potential timber resources of the Atchafalaya Basin. In 1819, James Cathcart embarked on an expedition to survey the timber resources of southern Louisiana and the Gulf Coast for the U.S. Navy. His narrative provides a glimpse of the inhabitants of the eastern Atchafalaya Basin in the early American period.

Arriving at Plaquemine in January 1819, Cathcart found that the lieutenant who had assembled the equipment and provisions for his trip from Plaquemine to Bayou Teche had unaccountably neglected to include any equipment, such as a sextant, necessary for a survey. Cathcart hired a Chitimacha guide named Charles, "an orderly indian," to guide him to the Teche, for the sum of \$9. Descending Bayou Plaquemine, Cathcart noted that the habitation at Ricar's, approximately 13 miles from Plaquemine, was the "last habitation on this rout (sic) [down Grand River and Belle River] between it and the Teche," although he in fact discussed at length the habitations of persons of Native American descent on the shore of upper Berwick Bay (Prichard et al. 1945:760). In doing so, Cathcart revealed numerous personal and cultural prejudices.

Cathcart found the passage on Grand River crowded with cypress stumps and knees, and at Lake Natchez, his boat frequently struck the muddy bottom. He went down Big Bayou Goddell, Belle River, and Bayou Long to "Lake Platt" (Flat Lake), thence to Grassy Lake, "Lake Chetimachas" (Grand Lake), and "Bayou Reed" [Lower Atchafalaya] to Atchafalaya Bay and the Teche. Although Cathcart saw no habitations on his journey to Grand Lake, the Basin was not devoid of human presence. Noting a very large gallows-shaped tree, he commented, "Did it depend upon me I would soon make it a gallows in reality, and hang a few of the rascally negro stealers, and smugglers, who infest this country" (Prichard et al. 1945:769). Cathcart commented that the timber in the Grand Lake area was unhealthy, but that the cypress and live oak elsewhere in the region were of a very large size, and he claimed Cypress Island for the United States (Prichard et al. 1945:772). On the west side of Berwick Bay at the south side of the mouth of the Teche, Cathcart noted Renthrop's Ferry. Peter Henry Rentrope or Renthrop was licensed by the Territorial Legislature in 1811 to operate a ferry from the Teche, through Lakes Plat, Palourde, de Jone, and Verret (Prichard et al. 1945:781). Renthrop's Ferry is shown on the Darby Map of 1816 (Figure 11). A mile above Renthrop's Ferry was Postion's Station:

...We arrived at Postions Indian settlement in the afternoon.... Postions settlement was composed of three huts; his own, Joe Jupiter's, the son of the former chief of the Chetimachaux, to whose tribe they belonged, and Joe Bios, who with all his family were absent. On our arrival Postion was asleep, having been intoxicated the day before, and had just return'd from a hunting party, where they got Taffia their favorite beverage; he is a mongrel between an Indian and a white man; their eldest son Pierre was likewise half drunk, and said he intended to fire upon us, but when he saw that we were arm'd with the cunning of an Indian, he turned it off, by saying it was to shew us where they lived, and to offer us their service; Madam Felicity, Postion's wife, was decently dress'd in a calico gown, and wore her hair put up in imitation of our ladies; she was modest, and reserved, and never drank any strong liquor, she had been the Belle of her tribe in her youth and was not ugly now for a woman of



Scale of English Miles.



Scale of Common French Leagues



Figure 11. Excerpt from map by W. Darby (1816) showing the study area and approximate locations of the Item E-64, Item E-76, and Item E-84a borrow areas (north to south) (Louisiana Collection, Tulane University).

her age and manners; their hut was clean and spacious, the frame was of cypress cover'd in and sided with double rows of Palmetto, which kept it dry, and warm, it contained three bed stands, one with Callico curtain, or mosquito bars, some common chairs which they lent us to sit on, a teapot, cups, saucers and some other crockery, and kitchen utensils, and in fact they seemed to live as comfortable as the lower class of whites do in general; at the door of their huts were Bear, Deer, and Raccoon skins, with Venison and wild ducks, and their lines were out to take fish, but the men were too drunk to take them in, they were however civil enough, and tolerably well dress'd; in their fields were very good corn, the ears of which were turn'd down to preserve the grain from the birds; and weather, as they as well as the whites in this country are too lazy to take it in, faster than they want to use it; they had likewise abundance of Pompions, and Hanover turnips. Postion owns hor[s]es and cattle, and is rich in the wealth most valuable to Indians; he is the chief of the tribe, speaks barbarous french, and a little English beside his own tongue, and the whole settlement are demi Roman Catholics. We purchased from him a small Batteaux, a duck, some venison, and pompions, on reasonable terms-- their dogs were numerous, and loquacious, had a natural antipathy to white men, but were great cowards, and never made an attack but in squadrons of four or five; they had likewise a very fine large cat, with long hair, quite fat, and sociable, a sure sign that it owners lived well-- Madame Juno, Joe Jupiters wife, was likewise a mongrel between an Indian, and a Negress, still retaining the curly wool of an African, but much longer, she was dressed like the other, in a callico gown, but had no shift! and a young woman of the same breed, who I suppose was her sister, wore a blanket only-- their hut was smaller, not so clean, and comfortable, nor so well furnish'd as Postions; Mr. Jupiter was very much intoxicated, and our pilot who knew him says he has the reputation of being a great Scoundrel, however he did not trouble us-- As from this settlement we intend to take a fresh departure in the morning; having procured a Batteaux or Canoe; fresh water and provisions, sufficient to last us some time... [sic throughout] [Prichard et al. 1945:781-783]

Cathcart also noted that cotton was already being grown on the banks of Berwick Bay, that squatters were prevalent in the Attakappas region (including the Atchafalaya Basin), and that keelboat traffic was frequent on the route from Bayou Plaquemine to Bayou Teche (Prichard et al. 1945:760, 790, 795). Steamboats appeared in the Atchafalaya Basin by 1819, and traffic across the basin was heavy enough by 1827 for efforts to clear Bayou Sorrel and Lake Chicot for navigation to have begun. The boats typically carried equipment and supplies into the basin and agricultural products out of it, or livestock across it. From Bayou Plaquemine, there were two most commonly used routes to the Teche. One was to descend Grand River to Bayou Long, thence to the lower Atchafalaya and the mouth of the Teche; the other, to leave Grand River at Bayou Sorrel and by way of Lake Chicot and Grand Lake, enter the Teche near Patterson (Castille et al. 1990:37, 41-42). The rise of steam transportation created a brief window of opportunity for commercial agricultural development in the Atchafalaya Basin, but was counteracted by the increasing frequency and severity of flooding after the late antebellum period.

A major difficulty in attempting to travel on the waterways of the Atchafalaya Basin was the frequency with which rafts of driftwood and debris choked the channels. The Ludlow map (1817) (Figure 10) and the map of Louisiana by William Darby (1816) (Figure 11) indicate a major raft on Grand River at Lake Natchez. Lower Grand River accumulated driftwood from the early decades of the nineteenth century, and by the late-1850s, Grand River below Bayou Sorrel was no longer navigable. An 1859 land ownership map of Iberville Parish by Sarony, Major, and Knapp of New York (Figure 12) indicates that by that date, Bayou Sorrel had replaced lower Grand River as the remaining route from Bayou Plaquemine to the Teche, and that only the operation of government boats kept Bayou Sorrel and Bayou Plaquemine open. Likewise, by 1860, upper Grand River was closed by rafts (Castille et al. 1990:37). Smaller rafts and driftwood occurred from time to time on nearly all Atchafalaya Basin watercourses.

The conventional view of settlement in the basin as propounded by Comeaux (1972) is that Acadians were pressured off of superior agricultural lands, particularly along the Mississippi, as the demand for those lands drove up prices (Comeaux 1972:10-12). Many of the interior lands of the Atchafalaya Basin were surveyed in the late-1820s and early-1830s, probably under the expectation that growing demand for agricultural land would lead to their settlement (Vigander et al. 1994:93). The presence of squatters, as noted by Cathcart, may have provided an additional impetus to the official surveying and patenting of lands in the Atchafalaya Basin. However, it is difficult to document that settlement of any kind occurred in the Grand River area of the eastern Atchafalaya Basin in the period prior to 1840. At Bayou Chene, as discussed by Castille et al. (1990), the 1850 census is the earliest in which residents appear in that area (Castille et al. 1990:23).

Lands in proximity to the survey areas along Grand River were surveyed in 1829 and 1831, and along Bayou Pigeon and Grand River in 1832 and 1833 (Manning et al. 1987:41). Sections in much of the Atchafalaya Basin were surveyed in a combination of the French arpent system of narrow tracts fronting on watercourses, and the standard American system of one-mile squares. In the Grand River region, the area above Bayou Sorrel along the low natural levees was surveyed in narrow tracts; the remainder, west and south to Grand Lake, was surveyed in squares.

According to Manning et al. (1987:41), during the 1830s, concentrations of settlement developed on Bayou Grosse Tete, Bayou Sorrel, and Grand River. Efforts began to clear the Atchafalaya River of rafts in 1840, and purchasers of basin lands were hopeful of a stimulus to economic development in the region. The Atchafalaya was clear of rafts by 1861 (Gibson 1982:137) but the consequences for agriculture were the opposite of any benefits gained from the improvement of transportation in the region. Prior to 1860, numerous crop years were ruined in the basin by flooding as greater quantities of water flowed into the Atchafalaya from the Mississippi (Manning et al. 1987:44). By 1845, numerous plantations had developed along Bayou Pigeon, Bayou Sorrel, and Grand River, owned primarily by absentee landlords and dependent on slave labor. By 1847 "all the public land in that region have (sic) been taken up. The price also of land under cultivation has improved. The cane crop of this year is remarkably fine" (Franklin *Planter's Banner*, June 17, 1847, quoted in Comeaux 1972:15). No sugar growers in the Atchafalaya Basin portion of Iberville Parish appeared in Champomier's annual Statement of the Sugar Crop Made in Louisiana until the 1849-1850 crop year. By 1844, sugar plantations were appearing in Champomier's

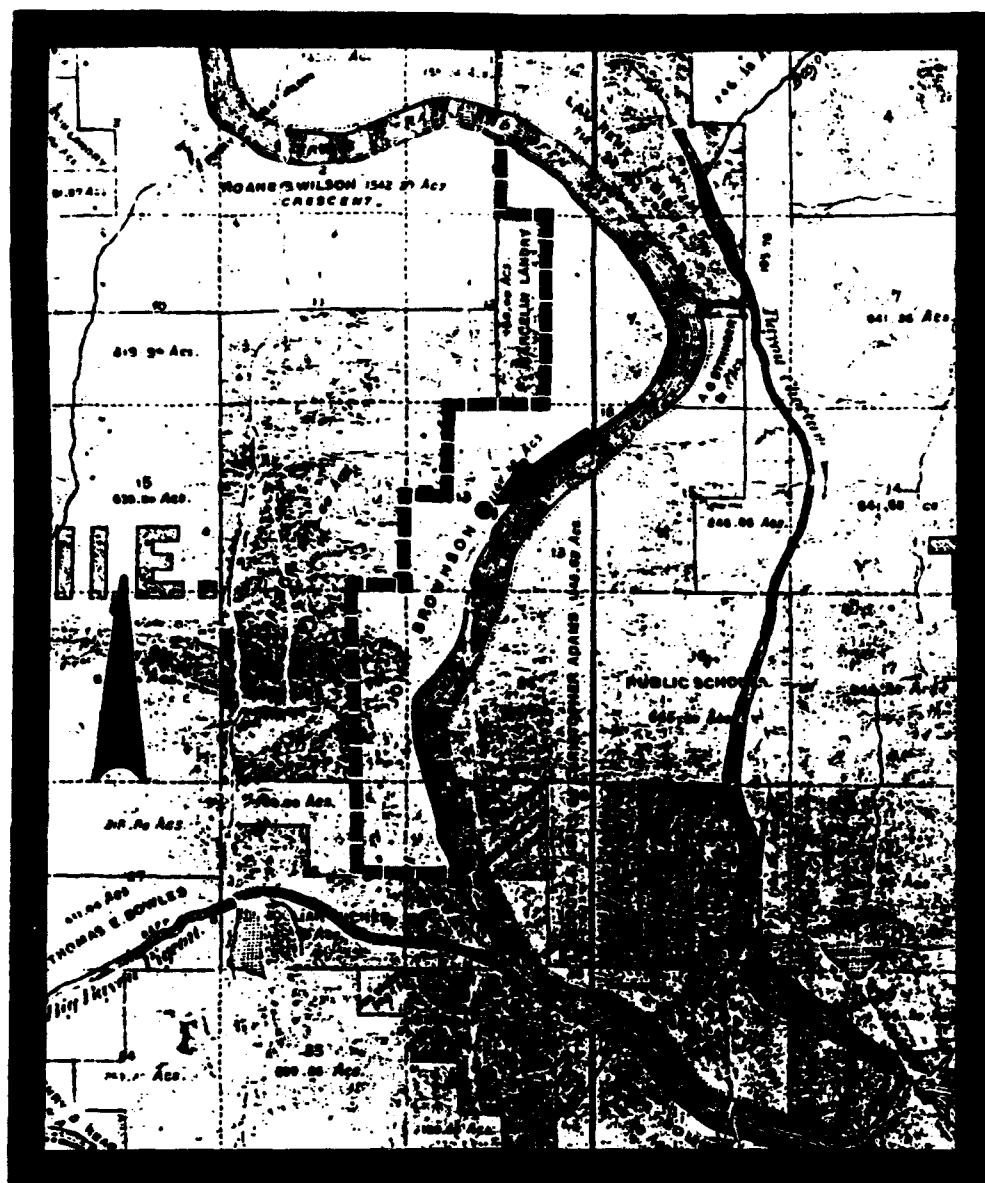


Figure 12. Excerpt from map by Sarony, Major, and Knapp (1859) showing land ownership in the vicinity of the Item E-64 borrow area. The approximate location of the parcel is indicated (no scale available) (Louisiana Collection, Tulane University).

Statement for Assumption Parish in the vicinity of Belle River and the Attakappas Canal; by 1850, sugar plantations were listed for Bayou Pigeon and Grand River. By way of contrast, along the Atchafalaya River, Alabama Bayou, and Bayou des Glaisses in Pointe Coupee and St. Martin Parishes, cotton plantations developed in the 1850s (Vigander et al. 1994:95). Data on sugar production in the Grand River area during the antebellum period is presented in Tables 1 through 3.

Previous researchers have expressed an interest in the ethnicity of settlers in the Atchafalaya Basin. An examination of surnames for plantation owners on Belle River in the antebellum period indicates that the majority of these larger landowners were of French extraction; a more sophisticated analysis might suggest whether their surnames were typically Acadian. On Bayou Pigeon and Grand River a noticeably larger proportion of "American" or English surnames occurs. An 1859 land ownership map of Iberville Parish by Sarony, Major, and Knapp of New York (Figure 12) permits a number of the sugar-growing plantations listed in Champomier's Statement to be located. The Item E-64 borrow area, in Section 13 of T11 S, R11 E, lies in a tract owned by John Brownson in 1859. Brownson owned another tract on Bayou Pigeon. Immediately above Brownson's Grand River tract is the plantation of Roane and Wilson, Crescent Plantation, which first appeared in the 1858 edition of Champomier's Statement. Crescent was owned by Roane and Hart as of 1860. Immediately adjacent to and south of Brownson's tract may have been the plantation of Justinien Michel, bisected by Big Bayou Pigeon. In 1859, the owner of this tract was Julian Michel. The plantation of George Micheltree or Micheltre was located to the southeast of Brownson's tract, fronting on Grand River. Micheltre's plantation, where a ferry across Grand River was located, was the site of numerous events in the Civil War (below). Adjacent to and below Micheltre on Grand River was the plantation of George Bolinger or Bollinger. Opposite Micheltre on the east bank of Grand River was the plantation of Laughlin and Nettleton. G.C. Laughlin was the tract's sole proprietor prior to 1858.

It is noticeable from the Sarony, Major, and Knapp map (Figure 12) that the owners at Bayou Pigeon/Grand River were a diverse group. In much of the Atchafalaya Basin, wealthy speculators had purchased vast acreages when the lands were originally sold by the State (Comeaux 1972:14; Vigander et al. 1994:112, 117). It is not known if the same pattern of purchase applied in the present study area. Some large landowners who purchased numerous tracts elsewhere in the basin, such as John Slidell, are depicted on the 1859 map. An examination of the 1860 Louisiana census index suggests that most of the landowners appearing on the 1859 map were absentee, and if their tracts were cultivated, it would have been by tenants or by slaves under the direction of an overseer. It is possible that Hart, Roane, Micheltre, and Laughlin were resident owners at their plantations in 1860, as Plaquemine was given as their post office in the 1860 census (LA 1860 Census Index).

Most of the sugar planters on this eastern side of the Atchafalaya Basin did not achieve production levels like the large planters along the Mississippi or Bayous Teche and Lafourche. Well-drained arable land was less extensive in the Grand River area and natural and artificial levees were even more feeble than in the more intensively farmed delta. Most of these Atchafalaya planters, whether or not they were resident in the basin, probably farmed their tracts with only a small complement of slaves. A few planters in the vicinity of Belle River, such as William Ivy, Gabriel Beasley, and Thaddeus Knight consistently produced large enough crops to be considered middling

Table 1. Sugar Production (in hogsheads), Assumption Parish; Vicinity of Belle River and Attakappas Canal, 1844, 1846 (from Champomier 1844, 1846).

	<u>1844</u>	<u>1846</u>
Beasley & Barrow	228	220
P. Theriot & G. Briant	-	0
Florentin Michel & Co.	58	32
Hippolite Porche	16	30
Adelaid Rousseau & Co.	35	23
Hue & Berthwick	26	-
Pierre Hue	-	18
Wm. Ivy	-	0

Table 2. Sugar Production (in hogsheads), Assumption Parish; Vicinity of Belle River and Attakappas Canal (from Champomier 1850-1862).

	1850	'51	'52	'53	'54	'55	'56	'57	'58	'59	'60	'61	'62
G. Beasley & Barrow	249	214	258	-	-	-	-	-	-	-	-	-	-
G. Beasley & Son	-	-	-	310	350	330	250	75	364	416	242	310	530
James O. Keane	-	-	-	-	-	-	-	-	10	11	6	12	25
Harding Burnley	-	-	-	70	98	65	104	51	95	199	120	180	190
Felix Dugas	-	-	-	-	-	-	-	-	0	18	26	23	40
Lufroy Guedry & Co.	-	-	-	-	-	-	-	-	28	-	-	-	-
Francois Darbon	-	-	-	-	-	-	-	-	-	-	-	17	80
Thiac & Courtade	-	-	-	-	-	-	-	-	-	45	41	70	30
Marcel Aucoin	-	-	-	-	-	-	-	-	-	-	-	14	28
Gross & Payan	48	25*	52	58	109	90	80	65	100	250	150	132	380
James Owens	30	0*	0	-	-	-	-	-	-	-	-	-	-
D. Rentrop	75	23*	60	103	176	-	-	-	-	-	-	-	-
Mrs. D. Rentrop	-	-	-	-	-	199	175	15	-	-	-	-	-
Campbell & Guidry	-	-	-	-	-	-	-	-	170	286	-	-	-
Wm. & V.H. Ivy	-	-	-	-	-	-	-	-	-	-	127	197	325
Thaddeus Knight	145	25*	126	202	308	175	266	12	400	354	-	-	-
Mrs. Thaddeus Knight	-	-	-	-	-	-	-	-	-	-	130	212	300
Adelaid Rousseau	16	0*	-	-	-	-	-	-	-	-	-	-	-
Wm. Ivy "Home Place"	106	0*	153	254	217	300	222	85	246	263	110	205	175

* overflow

Table 3. Sugar Production (in hogsheds); Grand River/Bayou Pigeon, Iberville Parish, 1850-1862 (from Champomier 1850-1862).

	<u>1850</u>	<u>'51</u>	<u>'52</u>	<u>'53</u>	<u>'54</u>	<u>'55</u>	<u>'56</u>	<u>'57</u>	<u>'58</u>	<u>'59</u>	<u>'60</u>	<u>'61</u>	<u>'62</u>
G. Micheltre & Co.	30	0*	0*	52	62	55	25	8	69101 ⁺	66	77	128	
J. Gall	31	0*	0*	-	-	-	-	-	-	-	-	-	
Mrs. Riggs	0*	0*	0*	-	-	-	-	-	-	-	-	-	
G.C. Laughlin	0*	0*	0*	0	21	40	27	10	60	-	-	-	
Nettleton & Laughlin	-	-	-	-	-	-	-	-	116	44	95	170	
Roane & Wilson "Crescent"	-	-	-	-	-	-	-	-	0	0	-	-	
Roane & Hart "Crescent"	-	-	-	-	-	-	-	-	-	25	17	299	
Justinien Michel	-	-	-	-	-	-	-	-	-	6	0	30	
Joseph Bollinger	-	-	-	-	-	-	-	-	-	28	20	67	
				* overflow			+ 74 burnt						

commercial sugar growers on the basis of their Atchafalaya Basin production alone. Numerous landowners in the Grand River area, including Ivy, had plantations elsewhere. Ivy, Beasley, and Knight had steam-powered sugarhouses in which to process their crop.

Late in the antebellum period, the area at the confluence of Bayou Pigeon and Grand River seems to have been a promising area for sugar cultivation, and growers Nettleton and Laughlin and Micheltre and Co. were able to construct steam-powered sugar houses by 1859 and 1860, respectively. Roane and Hart and Justinien Michel built steam-powered sugar houses on the eve of the Civil War. It may be that these planters had capital from previous commercial agricultural activities to invest in new ventures in the basin. Many of the eastern Atchafalaya Basin planters, however, still had horse-powered mills at the beginning of the Civil War (Champomier 1844-1862). Cotton was also grown in the Grand River area; Micheltre was a possible grower and there were no doubt others (Davis et al. 1893a:823).

There were a number of inhabitants in the study area during the antebellum period who practiced subsistence agriculture and extractive pursuits such as hunting, fishing, moss collecting, and lumbering. The vast timber resources of the region did not go unexploited prior to the development of industrial lumbering techniques around 1890. At least four sawmills were in the region by the Civil War. Offitt's sawmill, documented by Castille et al. (1990), was located on upper Grand River, and figured in Civil War events in the area. Offitt's sawmill appears on the map of the Atchafalaya Basin prepared by Henry L. Abbott in 1863 for the U.S. Army Corps of Engineers (Figure 13). Also on Abbott's map was Fuller's sawmill between Lake Chicot and Grand Lake. In closer proximity to the survey areas was Landry's steam sawmill, on Bayou Sorrel at its mouth on Grand River. Landry's mill was adjacent to the "Myrtle Mill" on Grand River, which may represent yet another sawmill. Landry's and Myrtle mills appear on the 1859 map by Sarony, Major, and Knapp (Figure 12), approximately two miles above Roane and Wilson's Crescent Plantation. A Federal military report from 1865 indicates that there was a sawmill at the southern end of Lake Verret (Davis et al. 1896a:803). These sawmills, supplied by pre-industrial float logging methods, are not likely to have been year-round operations sufficient to transform the landscape within their reach, as did industrial lumbering operations after 1890 (Mancil 1972:69-70).

The Civil War In The Grand River Area

The Civil War had a great impact upon commercial agriculture throughout Louisiana, and heavily influenced land use in the Atchafalaya Basin. Comeaux (1972) characterized the effects of the war, concomitant with increasingly severe flooding, as disastrous for agriculture and residence in the basin as a whole. More recent studies of portions of the basin have supported his contention (e.g. Manning et al. 1987; Vigander et al. 1994).

The area from the head of Grand River to its outlet at Six Mile Lake, stretching from Grand Lake in the West to Bayou Lafourche in the east, saw a great deal of military activity during the war. In early 1863, Grand River was considered by the Federals as a route for General Banks' forces on the Atchafalaya to the Union forces in the Baton Rouge area, but it was choked with driftwood and had been for nearly two years (Scott 1886:242-248). During Union General Nathaniel Banks' 1863 campaign

in the Atchafalaya Basin, Henry L. Abbott prepared a thorough map of the region (Figure 13). After the occupation of Donaldsonville and Plaquemine, Grand River was established as the Federal military perimeter, and it fell upon the commander of the Lafourche district to prevent movement by Confederate forces from west of the Atchafalaya towards New Orleans. Conventional military action by Confederate forces in the Atchafalaya Basin was largely confined to the western and southern portions of the basin, particularly after the Confederate ram *Queen of the West* was sunk on Grand Lake in April 1863 (Winters 1962:230-231, 234). Thereafter, Union forces had control of the waterways in the basin wherever extensive rafts and drift piles allowed them to operate gunboats and other vessels. However, for the remainder of hostilities, the Federals were annoyed by a guerilla war in the eastern Atchafalaya, requiring almost constant efforts against irregular Confederate forces, jayhawkers, bushwhackers, and smugglers that utilized the difficult terrain of the basin to their advantage.

It took Federal forces a great deal of time to determine how to conduct the war they were required to fight in the Atchafalaya Basin. In February 1864 a Union Patrol on upper Grand River confiscated a flatboat loaded with dry goods, curry combs, coffee, rope, flour, potatoes, quinine and other medicines, sundries, and \$30,000 in Confederate money. Quinine was a prophylactic and treatment for malaria, and a vital medicinal substance to both armies in Louisiana. This incident reinforced the growing conviction that an extensive smuggling trade was being carried on between Plaquemine and Butte La Rose (Davis et al. 1891:124-125). In the summer of 1864, Confederate irregulars became more active in the Grand River area. Confederate irregulars skirmished with Union pickets in July 1864 between Paincourtville and Lake Natchez, where the Confederates had crossed Grand River at Micheltre's plantation. Again in August 1864, Confederate guerillas encamped at Little Bayou Pigeon, and moving about in canoes, skirmished with Union cavalry at Grand River (Davis et al. 1893a:180-182, 260).

Near-hysteria gripped the Union command at the beginning of September 1864 as reports circulated that the Confederates were

...quite active on the other side of Grand River, such as hauling skiffs, etc., from Bayou Teche to Grand Lake, a large number of oars (1,000) being made by negroes for operations in that quarter. The enemy are occasionally crossing Grand River in considerable parties, some near the head of Lake Verret, others in the vicinity of Lake Natchez and above [Davis et al. 1893b:63].

Furthermore, torpedoes (mines) were falsely rumored to have been placed by the Confederates in Grand River, Belle River, and Bayou Pigeon. To add to the Federals' anxiety, a Union patrol of 35 men was surprised by a force of Confederates at Gentilly's plantation, near Bay Natchez, and only six of the Federals avoided capture (Davis et al. 1893a:730-731).

Assistant Adjutant General Frederic Speed in New Orleans called for a strong response to the situation. Speed suggested to Union general R.A. Cameron, commanding the Lafourche district, how to cripple the Confederates in the eastern Atchafalaya Basin; his solution, while sensible, doubtless entailed much antagonism of the local inhabitants. Speed suggested that all ferries, bridges, and boats between the La Fourche and Grand River should be destroyed (Davis et al. 1893b:64). Cameron

developed a three-pronged plan of attack on Confederate forces in the Grand River area, who proved to be a far smaller threat than expected. He sent a gunboat up Bayou Pigeon, which recovered a number of stolen horses and destroyed a large number of boats. Simultaneously a cavalry force scoured the countryside about Grand River, Bayou Natchez, Bayou Pigeon, and Grand Lake, destroying 20 flatboats and 40 to 50 pirogues, skiffs, and small boats. Additional horses and smuggled goods were confiscated. Gunboat #49 came upon troops of the 4th Confederate cavalry crossing their horses at Grand River, near their camp at Micheltre's plantation, located at the mouth of Bayou Pigeon. Twenty horses and one man were captured. The gunboat lost a portion of its upper works in the treetops as, with great difficulty, it turned around in Bayou Pigeon. Thirdly, the gunboat *Carrabasset* steamed from Lake Fausse Pointe, where it destroyed a large flatboat and a number of skiffs, to the planned junction of Union forces at Bayou Pigeon. A barge of cotton was found at Micheltre's plantation and with a large quantity of cotton stored in Micheltre's sugarhouse, was duly confiscated. On Grand River, additional flat boats and skiffs were destroyed. However, in contrast to some earlier Federal operations in Louisiana, the discipline of Union troops was relatively good, and private homes were not pillaged (Davis et al. 1893a:747-751, 821-824).

An official report of the Federal activities around Grand River in early September 1864 contained the following description of the area:

The country between the mouth of Bayou Pigeon and the junction of Grand River is one continuous wilderness. Until within one mile of the junction there is not a house or sign of any habitation although on either side of the bayou the land is dry and might be cultivated. It is covered with a heavy growth of live oak and thick clustering growth of underwood. There are numerous paths running through it in all directions, none of which shows signs of recent travel... Pigeon Bayou is very narrow and crooked, with large trees hanging over on every side, rendering it very difficult of navigation with as large [a] craft as the gunboat, although it has great depth, ranging from 10 to 20 feet... [Davis et al. 1893a:823].

In late September 1864, gunboat #43 ascended from Flat Lake, Bayou Long, and Belle River to within three miles of Lake Natchez; Bayou Long and Belle River were described as large, wide streams, navigable by gunboats. No Confederates were encountered, but a large quantity of salt meat, and other things that "indicated a contraband trade" were confiscated at Grice's plantation on Belle River (Davis et al. 1893b:470).

In early October 1864 the Federal gunboat *Nyanza* was despatched to Belle River, then ascended three miles up Bayou "Go to Hell" [Bayou Goddell]. Returning to Belle River, a report was received of a Confederate camp at "Pierre Pau" ferry [Pierre Part]. The gunboat apprehended one Confederate at the scene of the camp and destroyed 21 boats, including a launch of 3,500 pounds burden purportedly used for smuggling contraband. On October 21, 1864, a force of about 80 Confederates of the 4th Louisiana cavalry based on the Teche, came in boats up Grand River to Lake Natchez and then proceeded on a horse-capturing raid to the Lafourche. A Mr. Brown, resident at Palfrey's plantation, was arrested for having assisted the "raiders." Brown

alleged that he was robbed of his watch and \$50 in gold and silver by the Union officer in charge (Davis et al. 1893a:824, 891-892).

Federal officers realized that the policy of indiscriminately destroying all boats would antagonize Union sympathizers in the Grand River area and hinder the collection of intelligence. Therefore, in November 1864, it was ordered that permits were to be issued to "small loyal planters" to keep boats provided they were hidden at night from "guerilla thieves" (Davis et al. 1893c:581).

Military actions continued in the Grand River area during the last year of the war. In mid-January 1865, the Confederates had established a picket post at Grand Bayou and were recruiting in the neighborhood of Grand River. A Union expedition of one gunboat and one troop transport went from Brashear City to Grand River via Whiskey Bayou, then down Lake Mongoulois and Bayou Chene, and then returned to Brashear City. At the plantation of Captain King of the Confederate service, at the juncture of Bayou L'Embarras and Round Lake, a hogshead of sugar was confiscated. At the residence of Mr. Hart on Grand River, the Federal forces seized 600 cigars and "11 pairs of misses' gaiters [sic]" that were presumably intended for the contraband trade. Proceeding down Grand River to Lee's plantation, Mr. Lee was taken prisoner and 1,300 pounds of sugar and some small arms were confiscated. Returning to "Offutts" (Offitt's) Mill on Grand River, 10,000 feet of lumber were seized. Finally, before returning to Brashear City, 18 Union sympathizers were taken on board at Olivier's plantation at the mouth of Bayou Sorrel (Davis et al. 1896a:48-50).

Simultaneously with the above expedition, a Union cavalry force went on patrol from Napoleonville to Grand Bayou at a point where a drawbridge had recently been burned, to stop all communications from Madame Labarre's plantation with Bayou Corn. Scouting the area, it was determined that a Confederate recruiting party had left some days before. The horses of the Federal troopers became so exhausted from the difficult roads and swimming innumerable bayous that several drowned as a result of fatigue (Davis et al. 1896a:52-53). The Confederates were not finished harassing Union forces in the Lafourche district. At the end of January 1865, a Confederate force appeared at Richland plantation on the Mississippi and skirmished with the 3rd Rhode Island cavalry and the 80th U.S. Colored Infantry. The Confederate guerillas scattered in the swamps east of Grand River. A Federal force steamed from Thibodeaux to Lake Verret, and a skirmish ensued on the east side of the lake near the Foley and Beasley plantations. The Union forces in the Grand River area did not pursue the guerillas, to the great consternation of the command in New Orleans (Davis et al. 1896a:76-81, 83).

The Federal command was prepared to undertake more extreme measures to counter the guerilla situation east of Grand Lake. The policy of destroying all boats encountered in the Grand River area already must have caused great hardship to the inhabitants, who were dependent on water transportation for their livelihood. Likewise, the confiscation or destruction of sugar and cotton when found no doubt was a blow to planters. General T.W. Sherman in New Orleans suggested to Cameron in early February 1865 that "plantation supplies," probably seed corn and cotton and other agricultural necessities, be withheld from the inhabitants of the Grand River area if they did not provide better information on guerilla activity. Cameron concurred and proposed the construction of a large number of small boats at Bayou Boeuf, utilizing

lumber captured at Offitt's Mill, to pursue the guerillas "down the smallest bayou" as the only practical means of success (Davis et al. 1896a:730, 775).

The Confederates, whether guerillas or simply jayhawkers, reassembled a small force and in mid-February skirmished with Federal cavalry at Martin's Lane on Grand Bayou. The Confederates had crossed Grand River at Bay Natchez and then camped at Pierre Pass. While the Federals were in the process of searching "the houses and sugar mills in the vicinity" of Pierre Part, including the plantations of Ventress, Thompson, and Hartman, Mr. Thompson was plundered of his silverware and cutlery. The commander of the Union forces subsequently ordered an investigation. By this time the Grand River area had suffered quite a bit from anarchic wartime conditions; in February 1865 the entire region below Bayou Plaquemine was impassable, "the levee on Grand River being broken in many places." Captured Confederates reported that all their companies that had been raiding in the Lafourche district had been ordered to withdraw to Alexandria (Davis et al. 1896a:112-115, 120).

The Grand River area was quiet until the beginning of April 1865, when a Confederate force was reported to have crossed Grand Lake. General Cameron resolved to rid his district of the guerilla threat once and for all, having had prepared a large number of small boats with which to pursue the rebels into their bayou haunts. Again, a multi-part plan of attack was utilized. A gunboat and troops were sent to the head of Little Bayou Pigeon; a force of men in small boats was to ascend Grand River through Grass Lake, Lake Verret, and Bay Natchez; yet another force was to move overland from Donaldsonville by way of Grand Bayou to Bay Natchez; troops were to move from Napoleonville to Grand Bayou; and finally, cavalry were to descend from Plaquemine, closing off any remaining avenue of escape. The Confederates reached McCall's Plantation above Donaldsonville and collected about 50 horses and mules. A Confederate deserter reported that the guerilla force had come by way of Grand Lake, Bayou Pigeon, and Grand River, leaving their boats in Bayou Pierre Pass. The 16th Indiana Mounted Infantry came upon the Confederates at Whitaker's plantation, located at the junction of Corn Bayou and Grand Bayou. In the ensuing fight one Confederate was wounded and four captured, and all of McCall's horses and mules retaken. The remainder of the guerillas escaped by throwing away their weapons and clothing and swimming away in the bayous; the uniform of the Confederate commanding officer, Captain Whitaker (son of the plantation owner), was pulled from the bayou by Federal soldiers (Davis et al. 1896a:168-170, 173-174).

The Federal troops on Lake Verret destroyed all boats they encountered on both east and west shores. At Burnley's landing, located at Little Bayou Natchez and Lake Verret, the Federals sought to prevent Whitaker's escape. Burnley's house was surrounded and those inside arrested; four soldiers, a cotton speculator, a smuggler, and the proprietor. A box containing quinine, *morphiae sulphas*, cloth, and articles of clothing was seized. Numerous plantations and habitations were searched by the various Federal detachments involved in these operations, including Jaunte's, Blanchard's, Anderson's, and Dearbon's (Darbon's) on Pierre Pass; Ivy's on Belle River and Gross's near Belle River; Whitaker's (father of the guerilla leader) on Brule Creux; and Burnley's at Lake Verret. Despite the best efforts of the Union forces, however, the wily Captain Whitaker escaped up Lake Natchez into Choctaw Bayou, then to the Grosse Tete and out of reach (Davis et al. 1896a:175-177).

Even though Whitaker and most of his guerillas escaped, Confederate incursions across Grand River seem to have ceased with his retreat. However, Federal military operations continued in the Grand River area as rumors of jayhawker activity surfaced continually through the month of April. In early May, a Federal patrol of the country between Grand Bayou and Bay Natchez found all of it inundated by Spring flooding. No jayhawkers were in evidence, but a handful of Confederates, doubtless jayhawkers or bushwhackers, were rounded up near Bayou Chene at the same time. The commander of a patrol by the 75th U.S. Colored Infantry from Lake Palourde to Grand River and back in early May reported the following: "I saw none of the enemy and heard of none... I saw no land from the time of leaving Lake Palourde until I returned. The people, without exception, have moved away or are preparing to move" (Davis et al. 1896a:238-251). The war in the Grand River area, after a surprising amount of activity, was over. A late communication from New Orleans to General Cameron was to increase vigilance along the Atchafalaya, Teche, and Grand River line with the view of intercepting "Jeff Davis and his cabinet and the treasures they are reported to be seeking to take out of the country, in case they should pass in your direction" (Davis et al. 1896b:301). Davis was apprehended in Georgia on May 10, 1865. The last Confederate forces in Louisiana, under General Kirby Smith, did not surrender until June 1865.

The Postbellum Period Through The Early 20th Century

The severity and frequency of flooding in the Atchafalaya Basin was already increasing in the late antebellum period, and after the Atchafalaya River was cleared of rafts in 1861, the situation grew even worse. Combined with anarchic wartime conditions, flooding led to the virtual abandonment of agricultural efforts in much of the basin during the war. Consequently, fences, fields, and levees in the region were neglected, and mills, gins, barns, and houses were abandoned as inhabitants migrated out of the basin (Comeaux 1972:17).

By the spring of 1865, the Grand River area was empty of human habitation (above). However, within half a decade of the war's conclusion, some of the antebellum residents of the Grand River area were again attempting to raise sugar cane, as indicated in Tables 4 and 5. Gross and Payan, on Belle River near the Attakappas canal, had become major growers in the region by the end of the antebellum period, and they managed to produce a respectable 34 hogsheads of sugar in 1870. J.W. Beasley's Wildwood Plantation produced 230 hogsheads in 1870, a remarkable quantity for the Reconstruction period, when the losses of labor and capital equipment had not yet been recovered. The post-war recovery experienced by Mississippi River planters did not occur in the Atchafalaya Basin. Some smaller growers at Belle River, such as A.D. and S. Braud, Marcel Aucoin, and Dufosard Rousseau, grew minor quantities of cane prior to 1874. In that year, the Atchafalaya Basin experienced particularly severe flooding, and evidence supports the contention of earlier investigators such as Manning et al. (1987) that the inundation was a death blow to commercial agriculture in the region. An anomalous year of remarkably good production occurred in 1882, but this seems a possible typographical mistake or other error by Bouchereau. Otherwise, sugar cultivation at Belle River ceased or was uniformly unsuccessful after 1874.

In 1880-1881, Major C.W. Howell of the U.S. Army Corps of Engineers conducted a survey of the Atchafalaya River, including a portion of Grand River. Unfortunately, his survey stopped some distance above the site of the Item E-64 borrow

Table 4. Sugar Production (in hogsheds), Area of Attakappas Canal and Belle River, Assumption Parish, 1868-1917 (from Champomier 1868-1917).

	1868	'69	'70	'71	'72	'73	'74	'75	'76	'77	'78	'79	'80	'81	'82	'83
J.W. Beasley "Wildwood"	-	-	230	193	-	-	-	-	-	-	-	-	-	-	-	-
Damas Hebert (formerly F. Dugas)	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-
A. Braud (formerly F. Dugas)	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-
D. & S. Braud	-	-	-	-	-	34	0	0	0	0	0	0	0	0	0	-
James O. Keane	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardin Burnley	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Thiac & Courtade	-	-	0	0	0	0	-	-	-	-	-	-	-	-	-	-
Comeaux, Savoie, & Guidry	-	-	-	-	-	-	0	0	0	0	0	0	0	0	80	-
Emeraud Landry (formerly Francois Darbon)	-	-	0	0	0	0	0	0	0	0	0	0	0	0	30	-
Marcel Aucoin	-	-	0	0	0	5	6	0	0	0	0	0	0	0	28	-
Gross & Payan	-	-	34	50	82	-	-	-	-	-	-	-	-	-	-	-
J.M. Jones (formerly Gross & Payan)	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-
V. Bassetti (formerly Gross & Payan)	-	-	-	-	-	-	0	0	0	0	0	0	0	0	380	-
Dufosard Rousseau	-	-	-	-	0	10	0	0	0	0	-	-	-	-	-	-
W.N. & V.H. Ivy "Virginia"	-	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-
A.J.J. Barrus "Virginia"	-	-	-	-	-	0	0	0	0	0	0	0	0	0	325	-
Mrs. Thaddeus Knight	-	-	0	0	0	0	0	0	0	0	0	0	0	0	300	-
Wm. N. Ivy "Homeplace"	-	-	0	0	0	0	0	0	0	0	0	0	0	0	175	-

Table 5. Sugar Production (in hogsheads), Bayou Pigeon/Grand River, Iberville Parish 1868-1917 (from Bouchereau 1868-1917).

	<u>1868-</u> <u>1871</u>	<u>1872</u>	<u>1873</u>	<u>1874</u>	<u>1875</u>	<u>1876</u>	<u>1877-</u> <u>1888</u>	<u>1889</u>	<u>1890-</u> <u>1917</u>
Nettleton & Laughlin	0	0	0	0	0	-	-	-	-
Nettleton & Duncan	-	-	-	-	-	0	0	-	-
Estate G. Micheltre	0	26	13	0	0	0	0	-	-
Justinien Michel	0	15	9	11	0	0	0	-	-
J. Bollinger	0	0	0	0	0	0	0	-	-
Shlatre & McWilliams "Crescent"	0	-	-	-	-	-	-	-	-
Chopin & Beard "Crescent"	-	60	0	55	0	-	-	-	-
Dr. S. Chopin "Crescent"	-	-	-	-	-	0	0	-	-
Joseph Estrade "Vacherie"	-	-	-	-	-	-	-	0	-

area. In most cases, Howell only indicated the location of structures on his map and did not identify them or indicate their use. A number of structures are indicated on the Howell charts on Grand River between the head of Bayou Pigeon and the mouth of Bayou Sorrel, a distance of about 10 river miles. Whether any of these structures were occupied at the time of the survey is not definitely known.

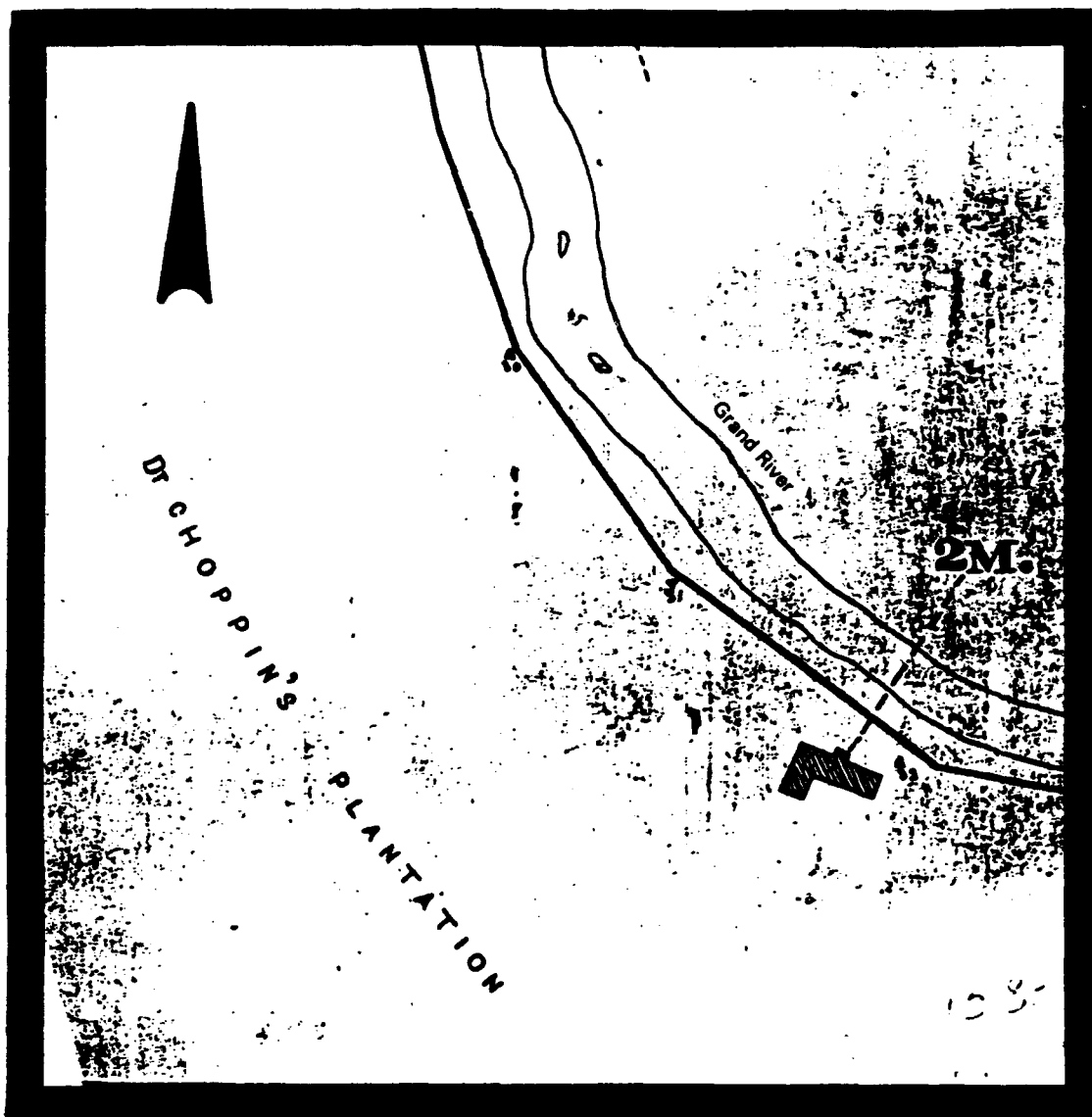
Howell ascended Bayou Sorrel for several miles, but descended Grand River for only two miles below the mouth of Bayou Sorrel. Howell noted "a sugar plantation now woods" on Bayou Sorrel about one and a half miles above its mouth on Grand River. A large structure, possibly this plantation's sugar house, was situated at the confluence of Bayou Sorrel and Grand River. Another "old plantation" was located on Bayou Sorrel some four and a half miles from its mouth.

Below the mouth of Bayou Sorrel, Grand River became particularly narrow and Howell indicates frequent accumulations of driftwood. At two miles below the mouth of Bayou Sorrel was Dr. Choppin's (sic) Plantation (Figure 14). Dr. Choppin's tract is also shown in Figure 15 lying above the parcel containing the Item E-64 borrow area. It is likely that the large structure shown at the two-mile mark was the plantation sugar house, somewhat protected by a levee fronting on Grand River.

From the way miles are denoted on Howell's survey it is apparent that Bayou Sorrel was considered a more significant water route between Grand Lake and Bayou Plaquemine than was Bayou Pigeon on lower Grand River. Throughout his survey of Grand River and Bayou Sorrel, Howell observed the prevalence of overhanging trees along the narrow watercourses.

A land ownership map of Iberville Parish by C.H. Dickinson published in 1883 (Figure 15) shows that there had been a nearly complete change of ownership in the area since the antebellum period. The Item E-64 borrow area lies on the tract that was owned by Young and Sharpless in 1883. No evidence that the tract was used for agriculture in the postbellum period has been found. Landry's sawmill does not appear on the Dickinson map. Evidently construction of a railroad line across the Atchafalaya Basin (or into it) in Iberville Parish had been started at some point prior to 1883 by the "Chattanooga Railroad." The rail line, probably projected, is shown on a map by Hardee (1870) (Figure 16). The "Old Grading" of the track appears on the Dickinson map running from west to east just to the south of upper Grand River and crossing the river below the mouth of Bayou Plaquemine. The line does not seem to have ever been completed since later maps do not show it.

At Bayou Pigeon/Grand River, the estate of George Micheltre, Justinien Michel, and Chopin and Beard's Crescent Plantation produced a few cane crops up to 1874, but none afterward. The last entry in Bouchereau's annual Statement of sugar and rice production for the Bayou Pigeon/Grand River area was 1889, when Joseph Estrade's Vacherie Plantation produced zero hogsheads of sugar. It seems likely that the planters remaining in the Grand River region after the Civil War did not concentrate solely on sugar growing, but rather also planted rice, an option utilized by under-capitalized planters all over southern Louisiana. Bouchereau does not provide any rice production figures for Grand River area plantations, but William Harris, the Louisiana state commissioner for immigration, wrote of Iberville and Assumption Parishes in 1888:



SCALE
(10 inches = 1 mile)



Figure 14. Excerpt from map by C. Howell (1880) showing Dr. Choppin's plantation on Grand River (Cartographic Information Center, LSU).

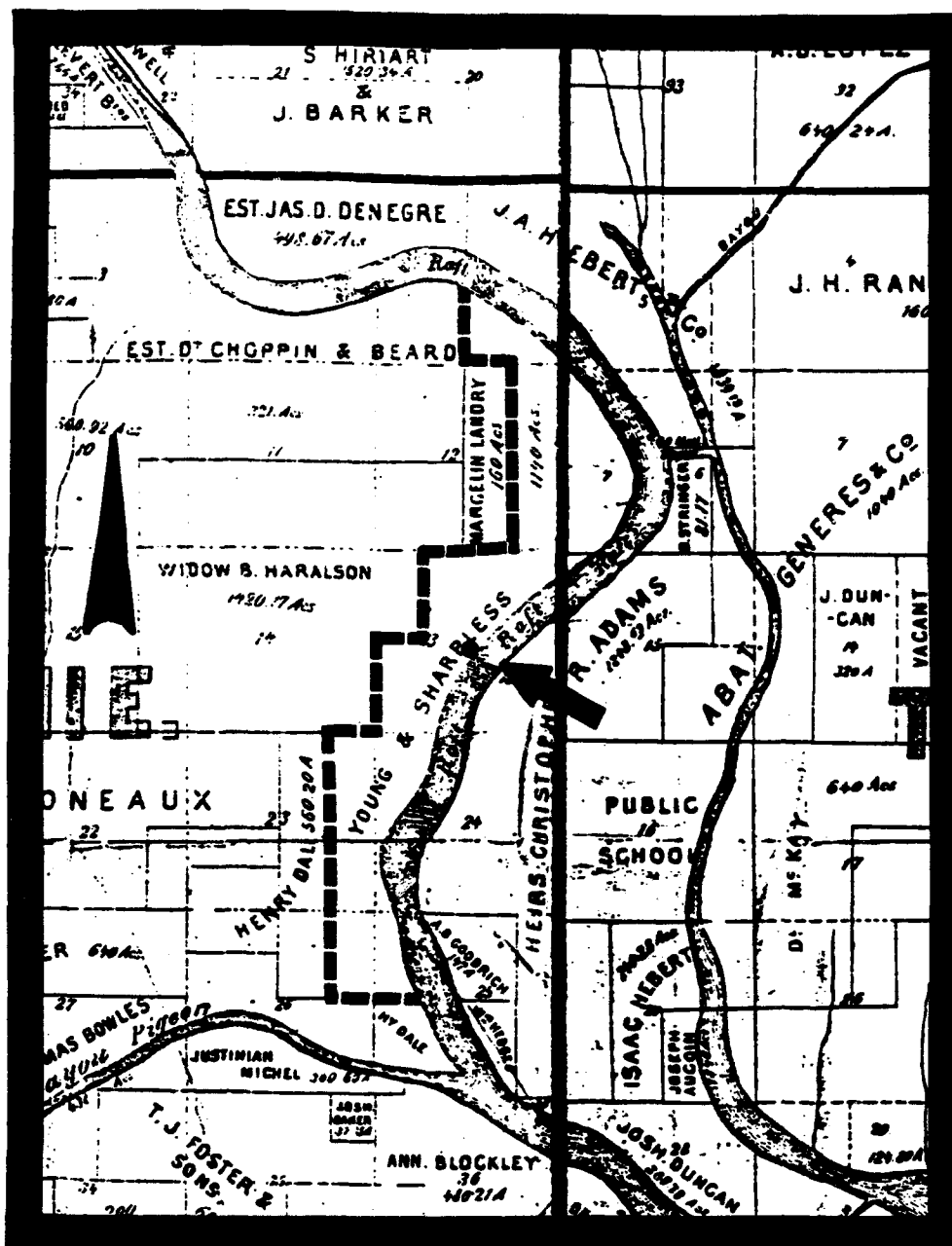


Figure 15. Excerpt from map by C. Dickinson (1883) showing land ownership in the vicinity of the Item E-64 borrow area. The approximate location of the parcel is indicated (no scale available) (Louisiana Collection, Tulane University).

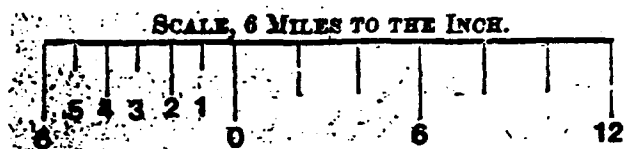


Figure 16. Excerpt from map by Hardee (1870) showing rail line along upper Grand River and approximate locations of the Item E-64, Item E-76, and Item E-84a borrow areas (north to south) (Louisiana Collection, Tulane University).

...the bayou banks are cultivated to the depth of from one to two miles back. In rear of the arable lands, are dense forests of cypress, oak, ash, and gum and other valuable timbers. The cypress is utilized by the planters to make coolers, hogsheads, barrels, cisterns, shingles, and general lumber. Up to this time no other use is made of the remaining valuable forest growth, except burning it for fuel...

In the southern part of [Iberville] Parish, along lower Grand River and its tributaries, bayous Pigeon and Sorrel, the lands have been partially cleared, and are of fine quality, but the overflows prevent their occupation to a great extent...

The plantations along the streams [of Assumption Parish] are generally laid off in large tracts, the front portion being appropriated to cane and corn, and the rear lands to tenants who cultivate rice...

There are large bodies of land in the interior, densely covered with fine cypress, at this time a little convenient of access, but as the timber now at hand is being rapidly consumed, these swamps in the near future must necessarily become very valuable. The timber business offers a large field for industry and enterprise, for exportation. Men used to the labor-saving machines of the North and West, and combining therewith a practical knowledge of curing and preparing this article of commerce, have presented to them a sure and profitable business... [Harris 1888:79, 82-84]

Harris's final points are among his more prescient observations. The industrial exploitation of cypress was the next great chapter in the history of the Atchafalaya Basin. George Coulon, a journalist, undertook a tour of the Atchafalaya Basin by skiff in the same year that Harris wrote the above comments, on the eve of the industrial logging period. Coulon (1888) generally describes the Atchafalaya Basin as a scene of primeval beauty, quiet and largely unpeopled. However, prominent in his travelogue are depictions of the unique "swamper" way of life. Swampers led an itinerant life within the basin swamps and bayous, engaging in fishing, hunting, and float logging for their livelihood. Some swampers resided at the edge of the basin and traveled in daily by boat. The swamper population was drawn from a variety of backgrounds, heavily Acadian but including a significant percentage of persons of non-Acadian European heritage; fully thirty percent of swampers in Iberville Parish may have been Native Americans, African-Americans, and persons of mixed descent, termed "redbones" (Grace 1946:232).

After 1890, the Atchafalaya Basin would enter a period of rapid change. Simultaneously with the decline of timber resources in the northern United States, technological developments allowed the exploitation of swamp stands of cypress that had previously been inaccessible with traditional float logging methods. Most important of these technological innovations were the pullboat, developed in 1889, and the overhead cableway railroad skidder developed around 1892. Between them, these two devices allowed exploitation of nearly all Atchafalaya Basin cypress. Sawmills produced 248 million board feet of cypress lumber in 1899 and one billion board feet in 1915; thereafter production declined as the supply of cypress stands was rapidly

depleted. Large-scale, industrial cypress logging was virtually over by 1925, only little more than a single generation after it began (Mancil 1972:76-77, 82-85).

Industrial cypress logging was a brief but intense ecological and cultural phenomenon with great impact on the ecosystem and human denizens of the Atchafalaya Basin. The landscape was rapidly transformed by the removal of virgin stands of forest, and the drainage of the region altered by pullboat "roads," the piercing of natural levees to maintain water levels, and the construction of railroad logging spurs and lines, which served to retard drainage. Two decades ago, many logging canals and tramways were still visible, with environmental effects that were not yet completely understood (Mancil 1972:88, 118, 162).

The cultural effects of the cypress logging industry in the Atchafalaya Basin have been considered in detail by Mancil (1972) and Comeaux (1972). Logging doubtless occurred in the Grand River area, as logging canals were indicated on the 1935 Lake Chicot USGS quadrangle map in the vicinity north of Lake Natchez. Major sawmills surrounded the Grand River area; mills were located in White Castle, Plaquemine, Napoleonville, Centerville, Plattenville, Crescent, and Indian Village (Mancil 1972:9). It is probable that while the area was being logged, Grand River and its tributary bayous would have contained temporary or mobile dormitories or quarterboats and other facilities associated with lumbering.

An examination of aerial photographs of the vicinity of the Item E-64, Item E-76, and E-84a borrow areas indicate that pullboat logging had occurred in proximity to at least Items E-64 and E-84a. The characteristic radial pattern of scars created by pullboat logging activity were visible approximately 2.6 km west of Item E-64, and along Choctaw Bayou approximately 2.8 km southeast of Item E-64. Pullboat scars were also visible approximately 2.3 km east of Item E-84a, between the site and Lake Verret. It is likely that any significant stands of first-growth cypress in proximity to all of the borrow areas were removed during the era of large-scale industrial cypress lumbering in the Atchafalaya basin.

Extractive pursuits such as trapping, fishing, and moss picking remained important to year-round residents of the Atchafalaya Basin during the heyday of the cypress logging industry. As early as 1873, fish dealers at Morgan City began to buy fish from inhabitants in the basin (Comeaux 1972:21). Fish-buying boats plied the waterways of the basin, collecting fish directly from the camp-boats of the inhabitants (Abbey 1979:14). The extension of railroads through the swamps in the late-nineteenth and early-twentieth century provided additional outlets for the sale of fish caught in the basin, from which they were transported in refrigerated rail cars to New Orleans and other markets (Castille 1985:16). The rail routes traversing the basin were the Southern Pacific lines through Morgan City and the town of Atchafalaya, and the Missouri Pacific through Krotz Springs. The Texas and Pacific Rail Road had a branch line from Plaquemine to Indian Village on Bayou Plaquemine.

The trapping of muskrat was a common winter activity for basin residents prior to the late 1920s; rising water levels disrupted the breeding grounds of these fur-bearers (Abbey 1979:16). Moss-picking developed as a small industry, reaching its peak during the 1920s when moss was highly in demand for upholstery stuffing. Moss was often collected from swamp residents by the fish-buying boat, then taken to a processing center to be soaked, dried, ginned, and baled. The community of Pierre

Part was a center of commercial moss processing until the industry went into decline in the 1930s (Abbey 1979:14-15).

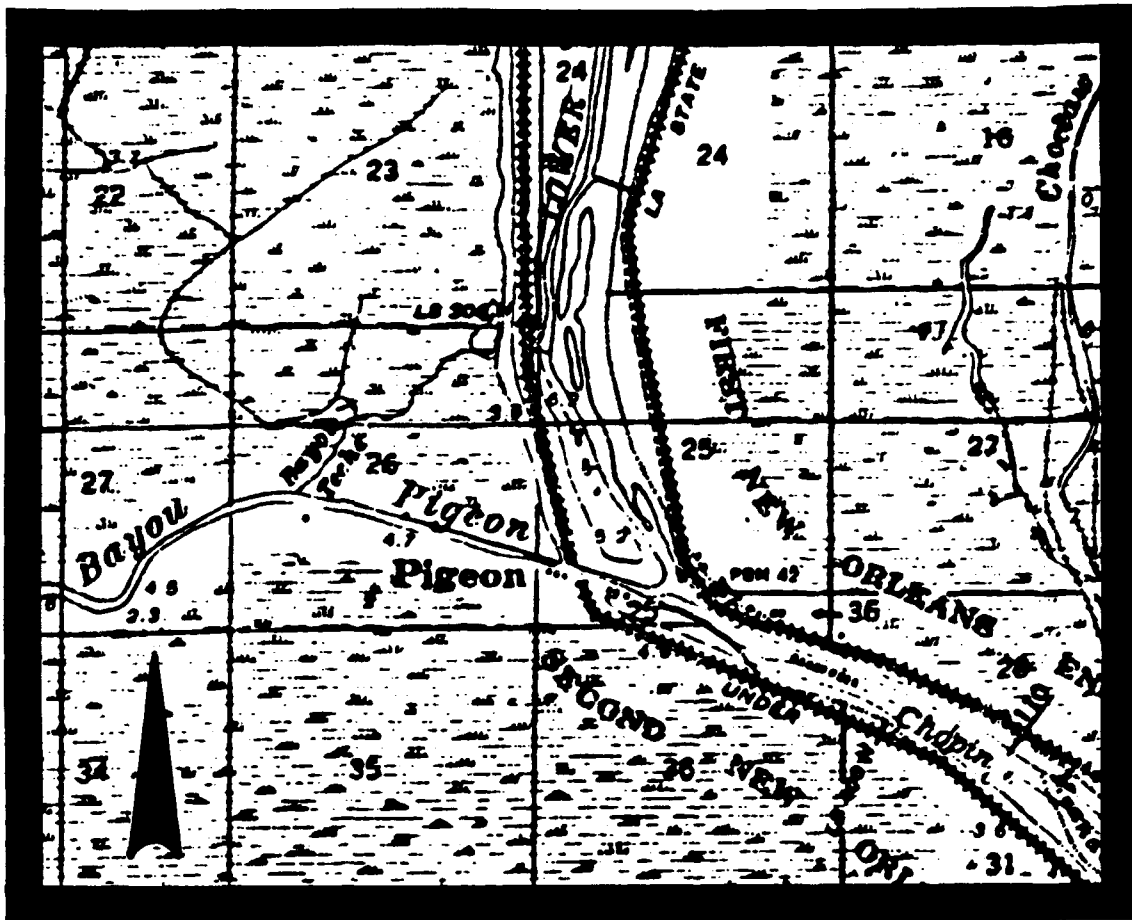
In 1927, much of Louisiana suffered particularly severe flooding, and outward migration from the Atchafalaya Basin was accelerated. Most inhabitants of the basin had pursued extractive subsistence activities since the later decades of the nineteenth century (Manning et al. 1987:48) and these became more difficult after the late-1920s, when higher water levels made many traditional pursuits less productive. Contemporaneously, the cypress logging industry went into rapid decline. The construction of the west protection levee and east protection levee (which for a portion of its extent followed the western bank of Grand River) reinforced the impetus to leave the basin. After the levees were built, virtually all remaining basin residents moved to the communities along the levees or to larger urban centers (Gibson 1982:150). The small communities of Bayou Sorrel, Pigeon, and Pierre Part benefitted from these residential shifts and have grown at varying rates since the construction of the levees and creation of the Atchafalaya Basin floodway. Also of major impact to the residential patterns in the vicinity of the survey areas was the construction of major intracoastal waterway features after 1935, such as the cut-off of Grand River from Bayou Sorrel (Bayou Sorrel lock) to Bayou Pigeon. The USGS Lake Chicot quadrangle maps from 1935 and 1959 show the growth of the town of Pigeon (Figures 17 and 18).

The extraction of petroleum became the major industry in the Atchafalaya Basin from the 1940s. Oil pipelines began to cross the basin in 1937 (Vigander et al. 1994:109) and by 1940, extraction had begun in the basin itself (Manning et al. 1987:48). Oil production throughout Louisiana was greatly increased as a result of the demands of World War II, and oil pipelines throughout the basin were extended and enlarged (Vigander et al. 1994:109). During the peak Louisiana onshore oil production years of the 1950s and 1960s, oil fields were developed in proximity to the survey areas. The rate of onshore drilling in Louisiana declined in the 1970s (Vigander et al. 1994:109) with a consequent slowdown of oil production in the Atchafalaya Basin as a whole. However, USGS quadrangle maps indicate that several of the oil and gas fields in the Grand River area expanded during the 1960s and 1970s.

Aerial photographs show that borrow pits were dug in the areas near Item E-64 and Item E-76 beginning in 1976 and 1978 respectively. These two parcels have been wooded since aerial photographs were first taken. From at least 1960, a set of what appear to be small, parallel ditches have been visible in aerial photographs of the parcel containing the Item E-84a borrow area. This could indicate that drainage efforts were undertaken for crop growing on the parcel at some point in time. However, the parcel containing the Item E-84a borrow area has been wooded since 1930, while cleared fields have appeared in proximity to it.

Summary of Archeological Expectations

No documentary evidence was discovered indicating habitation on the parcels containing the Item E-64, Item E-72, and Item E-84a borrow areas during the historic period. Thus, there is only a low probability of historic artifacts being found in the project impact areas. The presence of artifacts from historic land use, improbable as it is, is most likely in the area of the Item E-64 borrow. This parcel is known to have been bounded by tracts cultivated as sugar plantations in the antebellum period and



Scale

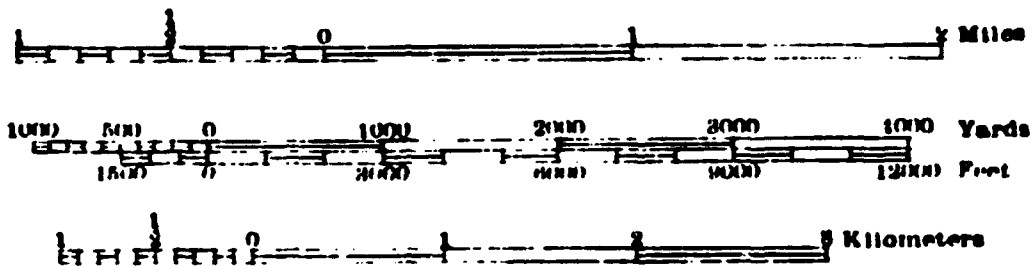


Figure 17. Excerpt from the USGS Lake Chicot quadrangle map (1935) showing the town of Pigeon.

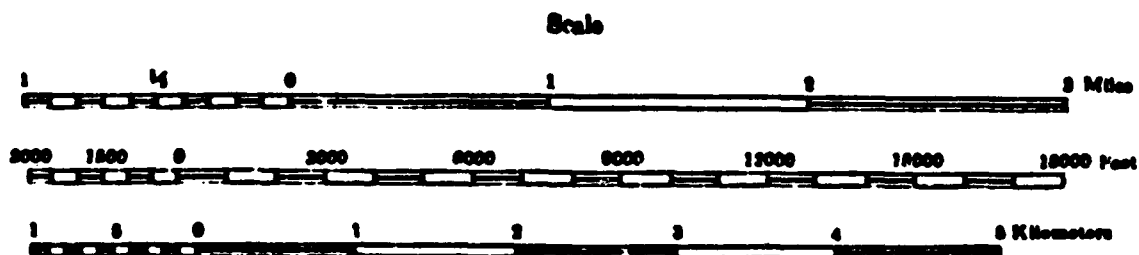
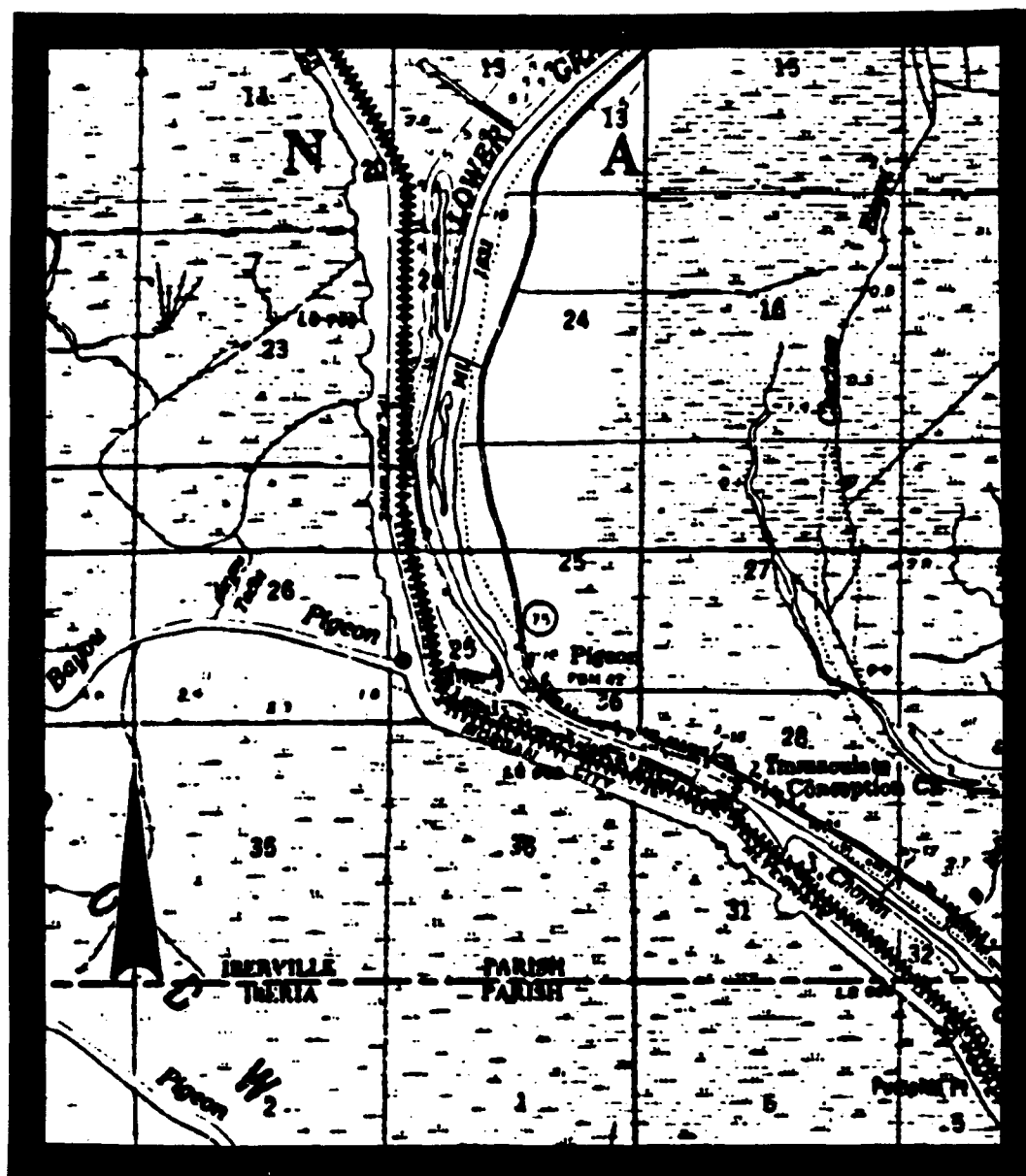


Figure 18. Excerpt from the USGS Lake Chicot quadrangle map (1959) showing the town of Pigeon.

after the Civil War, and may have been cultivated also. However, the likelihood of encountering artifacts related to antebellum occupation or cultivation seems very low. The Item E-84a borrow is also located in an area known to have had plantations and farms prior to the Civil War, but it is not known if this parcel was ever cultivated. Thus, the likelihood of finding artifacts of antebellum occupation and cultivation in the Item E-84a borrow area also seems extremely low.

CHAPTER 6 PREVIOUS INVESTIGATIONS

Clarence B. Moore (1913)

In the fall of 1912 and spring of 1913, the first reported archeological investigation in the Atchafalaya Basin was conducted by Clarence B. Moore. Sponsored by the Academy of Natural Sciences of Philadelphia, Moore visited various lakes and bayous associated with the Atchafalaya River. His study area extended from the Red River south to Morgan City and included the parishes of St. Landry, Iberville, St. Martin, Iberia, and Assumption (Moore 1913:9-10). Moore first sent a scouting team down the Atchafalaya River and associated waterways to locate possible mounds and to gain access to the private property where mounds were discovered. Moore himself traveled down the river following the navigable waterways that had been examined initially by his scout team in a "...steamer of light draught as headquarters in which men and material readily can be transported" (Moore 1913:6).

Although this early survey was limited only to the sites seen from the water's edge and would not today be considered a systematic survey, Moore did manage to collect data on 14 sites within the Atchafalaya Basin. Moore excavated some "trial holes" in three of these mounds near the present study area (Moore 1913:10-19).

He provided good written descriptions of mound size and shape, and position of internments if present, for such sites as Bayou Sorrel (16IV4), Schwing Place (16IV13), and the mound opposite Bayou Pigeon (16IV15). Moore's report was primarily focused on his retrieval of human remains. He provided little information on excavation techniques or general results. One exception to this is his discussion of baked clay objects found at two sites (16IV4 and 16IV13) which he associated with the Poverty Point culture (Moore 1913:13-16).

Fred B. Kniffen (1938)

The next notable archeological research in the Atchafalaya Basin was conducted by Fred B. Kniffen. In 1937, Kniffen visited sites within Iberville Parish and, to a lesser extent, Pointe Coupee and St. Martin Parishes (Kniffen 1938:190). He conducted surface collections at known sites including those documented by Moore, sites reported to him by local informants, and in some cases, sites found because "...a constant vigilance along the line of travel was rewarded with the discovery of unreported sites" (Kniffen 1938:190). He mapped 59 sites during his survey, of which 50 were placed into the category of either mound or midden. Kniffen based his ceramic analysis on Ford's chronological sequence for the Lower Mississippi Valley (Kniffen 1938:198-199). This sequence, one of the earlier chronological sequences for the area, is composed of four parts: Historic, Historic/Bayou Cutler, Bayou Cutler, and Bayou Cutler/Marksville. Kniffen analyzed pottery from 12 sites for classification according to a five-class category for ceramics. The sites were then classified according to the four-part chronology (Kniffen 1938:199). He then discussed those 12 sites within a geographic/chronological or "age-area relationship" (Kniffen 1938:202-205). Although Kniffen's report did not fully discuss the techniques used in his "surface collection," his report was one of the first to attempt chronological sequencing according to ceramic typologies for the Atchafalaya Basin.

William G. McIntire (1958)

The next survey of the Atchafalaya Basin did not occur until 1957, when William G. McIntire surveyed the Louisiana coastline. He surveyed 15,000 square miles of coastline from the Sabine River to the Pearl River and northward to 30 degrees 15 minutes north latitude. Only the lower portion of the Atchafalaya Basin was surveyed, specifically the Grand River Drainage System consisting of Grand Lake, the Lower Grand River, and the Lower Atchafalaya River to Atchafalaya Bay (McIntire 1958:1).

At each site he visited, McIntire took measurements from borings to determine depth and type of material the site was located on (McIntire 1958:18). He also made surface collections wherever possible. From these data (depth of site, soil type, and artifacts collected), McIntire classified each site and its physiographic base as representing one of the following site types: earth mound, shell mound, shell midden, black-earth midden, and beach deposits (McIntire 1958:7-8).

McIntire collected more than 40,000 sherds (McIntire 1958:18). From these sherds, he classified the sites within a chronological sequence which included: Tchefuncte, Marksville, Troyville, Coles Creek, and Plaquemine. This classification was transposed onto a coastal map for each time period. For the area within the Atchafalaya Basin, McIntire reported five Marksville sites, six Troyville sites, seven Coles Creek sites, and one Plaquemine site, all located near the Grand River Drainage System and Bayou Teche (McIntire 1958: Plates 4a, 5a, 7a, 8a).

Because McIntire never clearly defined how he conducted his survey beyond saying "...nearly 500 sites were either visited or reported within the area" (McIntire 1958:7), one may assume that he relied upon local informants and known sites for his information concerning site location. McIntire's survey, like those preceding it, would not be considered today to be a systematic search for sites. It was not until the mid-1970s that systematic surveys began to be conducted within the Atchafalaya Basin.

Sherwood Gagliano et al. (1975)

This survey, which included 315.1 miles along the Intracoastal Waterway and associated spurs, was conducted by Gagliano, Weinstein, and Burden in 1975. The spurs within the study area included the alternate route from Morgan City to Port Allen, Grosse Tete, Petit Anse, Tigre, and Carlin Bayous. The waterways, adjacent spoil, and their immediate vicinity were surveyed (Gagliano et al. 1975:1). The researchers' intent was to assess high-probability areas based on landforms and sediment dispersal. Very little information is presented in regard to specific sites. Only geographic regions within the project area are discussed.

Gagliano et al.'s (1975) research included archeological testing to define the presence and extent of prehistoric and historic archeological sites in the study area. The archeological investigations were conducted by boat, and consisted primarily of surface collection and examination of previously identified archeological sites. Previously unknown sites were identified by the presence of artifacts or shells associated with prehistoric middens (Gagliano et al. 1975:7-8).

This survey resulted in the identification of 158 sites within their study area. Of these, 78 were exposed on the banks of the waterways or within their spoil areas. A total of 150 prehistoric and 42 historic sites were discovered during the study.

The 1975 survey by Gagliano et al. examined one site in the immediate vicinity of the Item E-64 borrow area. This site is 16IV3, a mound four feet high and 25 feet wide. This mound dates to the Mississippi-Plaquemine Period and was first visited in 1954 by McIntire. Gagliano et al. (1975) did not indicate the condition of the site in 1975. The report simply states that the site was visited.

Robert W. Neuman and A. Frank Servello (1976)

Between October 1974 and March 1976, Robert W. Neuman and A. Frank Servello conducted the first major systematic survey within the Atchafalaya Basin. This project was funded by the Corps of Engineers and included Avoyelles, Point Coupee, St. Landry, Lafayette, St. Martin, Iberville, Assumption, and St. Mary Parishes. Neuman and Servello surveyed corridors and small blocks adjacent to the basin. The northern and central areas of the basin were sectioned off into quadrants with attempts at 100% coverage, but due to the sediment rates within the basin and time constraints, the survey area was reduced to checking along natural levees of relict and extant bayous (Neuman and Servello 1976:10). In the southern portion of the basin, the survey concentrated on, but was not limited to, the natural levees of active and relict channels (Neuman and Servello 1976:10).

Neuman and Servello (1976) conducted extensive archival research which was followed by field survey. The survey was conducted using a two-to-five-person crew, boats, four-wheel-drives, bankline survey in the southern area, and helicopters in the extreme southern area (Neuman and Servello 1976:8). However, sites previously recorded by McIntire and Kniffen were not visited, but were placed on the site map. Neuman and Servello stated that, "All recorded sites for which there was locational and other data, have been incorporated into the report" (Neuman and Servello 1976:8).

Neuman and Servello classified all 133 sites that they examined into one of the following categories: shell midden, earthen midden, multiple mounds with associated middens, and isolated mounds (Neuman and Servello 1976:11-13). The 133 sites were located in the Atchafalaya Basin and ancillary survey areas. Of the 133 sites, 77 sites were newly discovered and 56 were previously recorded. Twenty-three of the previously recorded sites were revisited.

Neuman and Servello's systematic survey advanced archeologists' understanding of the prehistory of the basin. A large number of previously unknown sites were recorded. Also, the survey provided a better basis for discussions of such things as settlement patterns, site distribution patterns, and the chronological sequence within the basin. Some of the patterns identified during their survey included: the locations of tumuli versus shell middens, the location of Archaic and Tchefuncte sites on basin's periphery, site location on extant and relict bayou levees and lake shores, and finally, the absence of sites along the Atchafalaya River itself (Neuman and Servello 1976:72-73).

Robert W. Neuman (1978)

The pedestrian survey reported in Robert Neuman's 1978 report was conducted between 1976 and 1978 in Assumption Parish, Louisiana, near the small town of Pierre Part. The survey is divided into two related, but separate, sections near Routes 2 and 3 of LA Highway 70. Pedestrian survey was conducted to determine if any previously unknown prehistoric or historic archeological sites were located in the study area. This survey failed to discover any new sites.

The only site located in the immediate vicinity of the study area was 16AS15, which was situated south of the survey area and northwest of Lake Verret. The site has been described as a shell midden, and may be the remains of a neo-Indian camp or extraction locale. However, no cultural affiliation or exact age has been assigned to the midden (Neuman 1978). This site is located approximately three miles north of the Item E-84a borrow area.

Jon L. Gibson (1978)

From March through December of 1977, Jon L. Gibson conducted a Corps of Engineers-sponsored survey of several waterways southeast of Morgan City in St. Mary, Assumption, and Terrebonne Parishes between U.S. Highway 90 and the Gulf of Mexico. Gibson posed a series of theoretical questions which dictated the approaches or goals for the systematic survey of these areas: the banks of Bayou Chene from its confluence with Bayou Black through Avoca Island Cutoff to the entrance of the Lower Atchafalaya River; Bayou Shaffer from its source at Bayou Boeuf to the Lower Atchafalaya River; the Lower Atchafalaya River from Berwick Bay to the Atchafalaya Bay; and finally, an overland corridor bounded on the west by the Lower Atchafalaya River; on the east by the line corresponding to the eastern section line of conjoined Sections 4, 9, and 16 in T18 S, R12 E; on the north by Avoca Island Cutoff, and on the south by the Atchafalaya Bay (Gibson 1978:1). His stated goals for the systematic survey were to locate cultural resources in order to mitigate adverse project impacts, and to analyze and to explain the variability in the prehistoric sites within the project area. These goals or approaches were implemented using various survey techniques (Gibson 1978:2-4).

Gibson found and reported 18 sites in Assumption Parish, 12 sites in St. Mary Parish, and 12 sites in Terrebonne Parish. In conjunction with his systematic survey of the project area in the lower basin, Gibson also provided in-depth, theory-based discussions of the culture history of the Lower Atchafalaya Basin. The main focus was on chronological sequencing of prehistoric and historic populations (Gibson 1978:30-65) and on the natural environment, geomorphic development, landforms, waterways, elevation and flooding potential, and relief and slope, because all these could have influenced site location and use (Gibson 1978:66-117). Finally, Gibson discussed the analysis of the cores and the reconstruction of sedimentary environments for each site and performed a chi-square statistical analysis for site dispersal within different environmental zones (Gibson 1978:183-260). The results of the tests suggested that aboriginal populations were choosing natural levees instead of swamps and marshes, and that there was a higher frequency of sites in the swamp-marsh ecotone rather than within the interior of either zone (Gibson 1978:230-2231).

William G. McIntire (1980)

In 1980, William G. McIntire conducted a Level I archeological survey along the eastern edge of Lower Grand River near Pigeon and Bayou Sorrel, Iberville Parish, Louisiana (McIntire 1980:iv). The purpose of the survey was to ensure that no significant archeological sites would be impacted by the construction of a sanitary sewer system in the proposed area (an approximately 25 m wide strip).

Preceding the pedestrian survey, archival research was conducted to identify any previously recorded historic or prehistoric sites in the study area. Four known sites were located in the vicinity of the study area (16IV3, 16IV4, 16IV13, and 16IV27). The results of McIntire's survey indicated that the construction of the sanitary sewer system would not impact any known prehistoric or historic sites. The survey did not discover any new sites in the survey area (McIntire 1980:8).

William G. McIntire (1981)

This survey was conducted in order to ensure that the construction of a pipeline corridor, stretching from Weeks Island, Louisiana, to Little Creek, Mississippi, would not impact significant archeological resources (McIntire 1981:V). Part of this survey was conducted directly north of the Item E-84a borrow area. Background research indicated that three prehistoric sites (16AS5, 16AS17, and 16AN14) were recorded in proximity to the construction corridor. However, 16AS5 and 16AS17 could not be located. 16AN14, located approximately 1,000 feet from the project area, was not tested since no construction impact was expected. No historic sites or structures had been recorded within the study area.

Prior to the on-the-ground survey, a helicopter was utilized to scan the entire length of the project area. This procedure was utilized in order to facilitate the identification of potential high-probability areas such as natural levees and lake shores. Hand auguring and shovel testing was then undertaken. Areas which could not be reached by car or boat were accessed by foot. In this way, approximately 90% of the entire impact area was able to be examined (McIntire 1981:8). No sites were identified as a result of these efforts (McIntire 1981:12).

Jon L. Gibson (1982)

Jon L. Gibson conducted a survey around the periphery of the Atchafalaya Basin Floodway between July 1979 and September 1980. This large-scale survey covered 295 kilometers in portions of Avoyelles, Pointe Coupee, St. Landry, St. Martin, Iberville, Assumption, and St. Mary Parishes. This survey was for the construction and maintenance of the East and West Atchafalaya Basin Protection Levees which demarcate the Atchafalaya Basin Floodway. The survey was conducted in five segments along the east and west protection levees, as well as segments of levees west of the Berwick area, west and southwest of Morgan City (Gibson 1982:31-36). The two approaches utilized by Gibson in this study were: 1) an ethnographic survey of present population in the area, and 2) an archeological survey utilizing augers, shovel tests, and surface collections.

Gibson's survey recorded two sites in Pointe Coupee Parish, one site in Iberville Parish, six sites in St. Martin Parish, fourteen sites in St. Mary Parish, two sites in

Iberia Parish, five sites in St. Landry Parish, and two sites in Avoyelles Parish. Gibson also discussed several sites which he recommended as significant and for which he stated mitigation should precede construction impacts. These sites are: Bayou Sorrel (16IV4), Lost Hill (16SM51), Nutgrass (16SM45), Brick (16SMY130), Bayou Shaffer Waterlocks (16SMY52), Moccasin (16SMY104), Henry Knight (16SMY107), Charenton Beach (16SMY2), Bisland (16SMY166), Bayou Perronet (16SM50), Savage (16AV68), and Dupont Des Glaisses (16AV69).

Joseph V. Frank, III (1985)

This survey was conducted near Bayou Pigeon, Louisiana, between the Items E-64 and E-76 borrow areas. The survey was conducted in order to ensure that dredging for a boat slip canal would not impact archeological resources in the vicinity. The study consisted of a Level I archeological survey in the proposed dredging area (Frank 1985:2).

Archival research revealed that one prehistoric site (16IV3) was located in proximity to the project area. An attempt was made to relocate the mound. A discussion with a local resident indicated that part of the mound had been destroyed, and that a house now sat on the top. This being the case, no surface collection or site definition was attempted (Frank 1985:9).

The pedestrian survey included systematic shovel tests to locate archeological sites in the project area. Immediately following the survey, five auger tests were excavated in the parking lot for the proposed project. The first 19 cm of soil contained disturbed sand and gravel. Below this disturbed level was a thick layer of clay. The water table was reached at 50 cm below surface.

No prehistoric or historic sites were identified in the study area. This was partially attributed to environmental and human factors affecting the presence of sites in the area (Frank 1985:12). These factors include frequent flooding and modern disturbance due to construction.

Kathy Manning et al. (1987)

R. Christopher Goodwin and Associates, Inc., conducted a cultural resources survey of portions of Item E-44 of the EABPL in 1987. This survey consisted of two parts: 1) assessments of High/Low Probability areas, and 2) pedestrian survey and literature review. The survey failed to locate any archeological resources in the study area; however, the literature review revealed that four previously recorded sites were present just outside of the proposed borrow areas. Of these four sites (16IV4, 16IV13, 16IV15, and 16IV17) only 16IV4 and 16IV13 are located close enough to the present study area to warrant mention here. These sites will be discussed further below.

A total of 13 proposed borrow areas were surveyed for evidence of prehistoric or historic archeological sites. Because none were discovered, several explanations were proposed to account for the apparent lack of archeological debris:

These include: the lack of human activities within the project area that would have created an archeological record, the burial of once-existing sites by recent sediments thereby preventing their discovery, and the inability of the survey techniques employed to discover the resources present within the study area [Manning et al. 1987:87].

The study area was located primarily in backswamp areas. Manning et al. (1987) indicates that this is the primary reason for the lack of archeological sites in the study area. Previous studies of the Atchafalaya Basin indicate that most prehistoric sites are located on accessible distributary levees. Very few of these were present in the study area (Manning et al. 1987:87). Furthermore, there is indication that a high degree of sedimentation was occurring in the area which may have buried potential sites too deeply to be discovered by pedestrian survey techniques.

Sites in Proximity to the Item E-64 Borrow Area

Four sites recorded in the site files at the Division of Archeology are in the vicinity of the Item E-64 borrow area: 16IV3, 16IV4, 16IV13, and 16IV27. Site 16IV27 is located approximately 1.5 miles northeast of the parcel near Choctaw, Louisiana. However, very little information was recorded for this site, and its cultural affiliation is not identified.

Site 16IV3 (the Little Bayou Pigeon Site) is located approximately 1 mile south of the Item E-64 borrow area near Lower Grand River. This site is a Mississippian/Plaquemine temple mound. A single square temple mound is located at the site, but the actual site dimensions are unknown. Investigations at the site have been conducted by Kniffen (1938), McIntire (1958), Neuman and Servello (1976), and Frank (1985).

Site 16IV4 is located approximately 5.7 miles north of the Item E-64 borrow area on Bayou Sorrel. This site also consists of a truncated mound which stands 5.5 m in height. The cultural affiliation of the mound is believed to be Poverty Point, Tchefuncte, or Plaquemine. Investigations at 16IV4 have been conducted by Moore (1913), McIntire (1958), and Kniffen (1938).

The final site located in the vicinity of the Item E-64 borrow area is 16IV13, which is located 4.2 miles north of the parcel and 3/4 mile east of the Lower Grand River. This site has been named the Schwing Place Mound and has been dated to the Poverty Point or Tchefuncte Period. This is a single, low mound with burials. Investigations at this site include those by Moore (1913), Kniffen (1938), and McIntire (1958).

Sites in Proximity to the Item E-76 Borrow Area

The only previously known site in the vicinity of the Item E-76 borrow area is 16IB7. This site is located across Little Goddel Bayou from the parcel and slightly south. 16IB7 is a Coles Creek period site first visited by McIntire in 1952. The only other visit was by Kniffen and Beecher in 1976. State site forms are incomplete for this site, but apparently surface collection(s) was undertaken.

Sites in Proximity to the Item E-84a Borrow Area

Only two sites are located within close proximity to this parcel: 16AS3 and 16AS2. Site 16AS3 is located approximately 150 m west of the parcel. This site is a shell midden which dates to the Markesville, Coles Creek, and Troyville Periods. Surface collections were made during previous surveys by Kniffen (1938) and McIntire (1958). An attempt was made to relocate 16AS3 during the course of the present survey; however, no evidence of the site could be found during a full day of searching the mapped location and its vicinity. It should be noted that surveys by Haag (1975) and Neuman (1978) also failed to relocate this site.

Site 16AS2 is located approximately 500-700 m southwest of the Item E-84a borrow area. This site is also a shell midden and has not been assigned to a cultural period. 16AS2 was first reported by Kniffen (1938).

CHAPTER 7 FIELD INVESTIGATIONS

Methodology

Intensive pedestrian survey was conducted within the three borrow areas (Items E-64, E-76, E-84a) comprising the study area. Transect lane spacing of 20 m with screened shovel tests at 50 m intervals along the transects were utilized. In order to maximize the potential for site discovery, the transects were oriented parallel to the former distributary channels. Shovel tests were also excavated in a staggered pattern along each transect to ensure maximum coverage. All shovel tests measured 30 x 30 cm and were excavated to a depth of 50 cm below surface. Shovel tests were halted at this depth due to the shallow water table. All excavated soil was screened through 1/4" mesh to the extent possible. Soils that could not be screened were carefully troweled and examined for artifacts. Shovel tests were not excavated within the inundated portions of the three parcels. Soil profiles were not drawn for each shovel test due to the uniform nature of the soil within the three parcels.

All positive shovel tests were treated as possible sites. Additional shovel tests were excavated along lines in the cardinal directions from the positive test in order to discover the subsurface horizontal and vertical extent of the debris. These additional shovel tests were placed at 10 m intervals, and each line was extended to two negative shovel tests wherever possible. A 100% surface collection within a 5 x 5 m area was made at each site in order to compare the density of surface scatters between sites. At the completion of site definition, a site map was drawn of the area showing the location of natural and cultural features and of all excavation units. Site maps, field notes, and artifacts were be curated at the Louisiana Division of Archaeology in Baton Rouge.

Item E-64 Borrow Area

The Item E-64 borrow area is located in Iberville Parish, approximately 2 miles north of Pigeon, Louisiana. This parcel consists of the remaining portion of the former E-58 borrow site. The dimensions of this area are 1.1 km along the north/south axis, and variously from 200 m to 1.5 km along the east/west axis. This parcel was divided into two areas, Area A and Area B, in order to facilitate coverage. Area A includes approximately 80 acres, and parallels the EABPL on its north/south axis (Figure 19). Area B is comprised of 40 acres northeast of Area A. Area B is bounded by the Lower Grand River and a previous borrow site (Figure 20).

The southern boundary of the parcel was used as the baseline for pedestrian survey for Area A. The baseline for Area B was a north/south line approximately 850 m west of the east parcel boundary. Lane spacing was marked at 20 m intervals along each baseline. Water levels in the Lower Grand River were high; thus, approximately 10 m of the parcel on the river side was inundated. The transects paralleled the river as closely as possible.

A total of 22 transects were located in this parcel. Of these, 15 were in Area A and seven in Area B. The parcel was partially inundated as a result of the presence of an old borrow pit and inundated canal. Because of the previous borrow pit, only the first and seventh transects of Area B reached the eastern boundary (Figure 16).

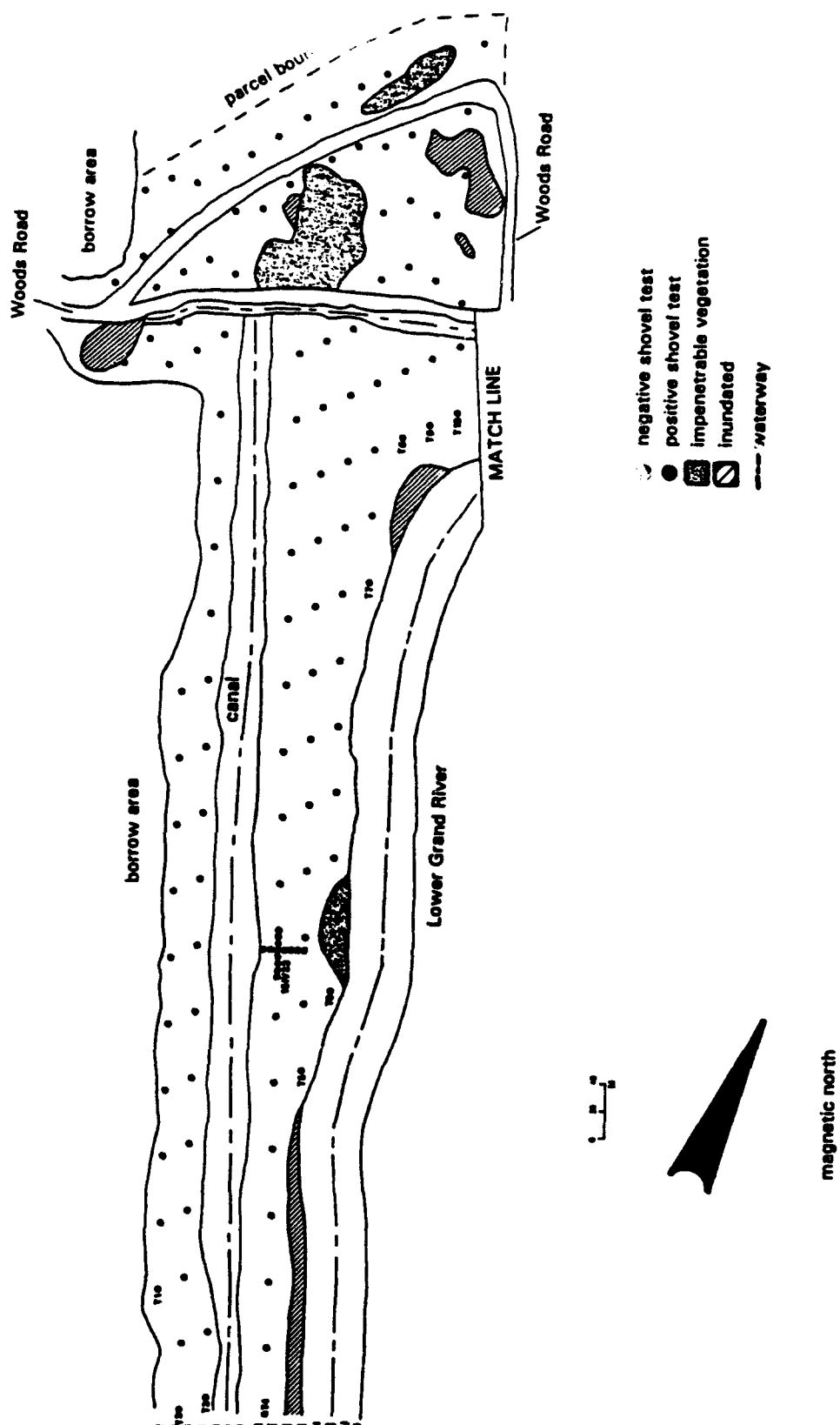


Figure 19. Detail of shovel tests within Area A of the Item E-64 borrow area.

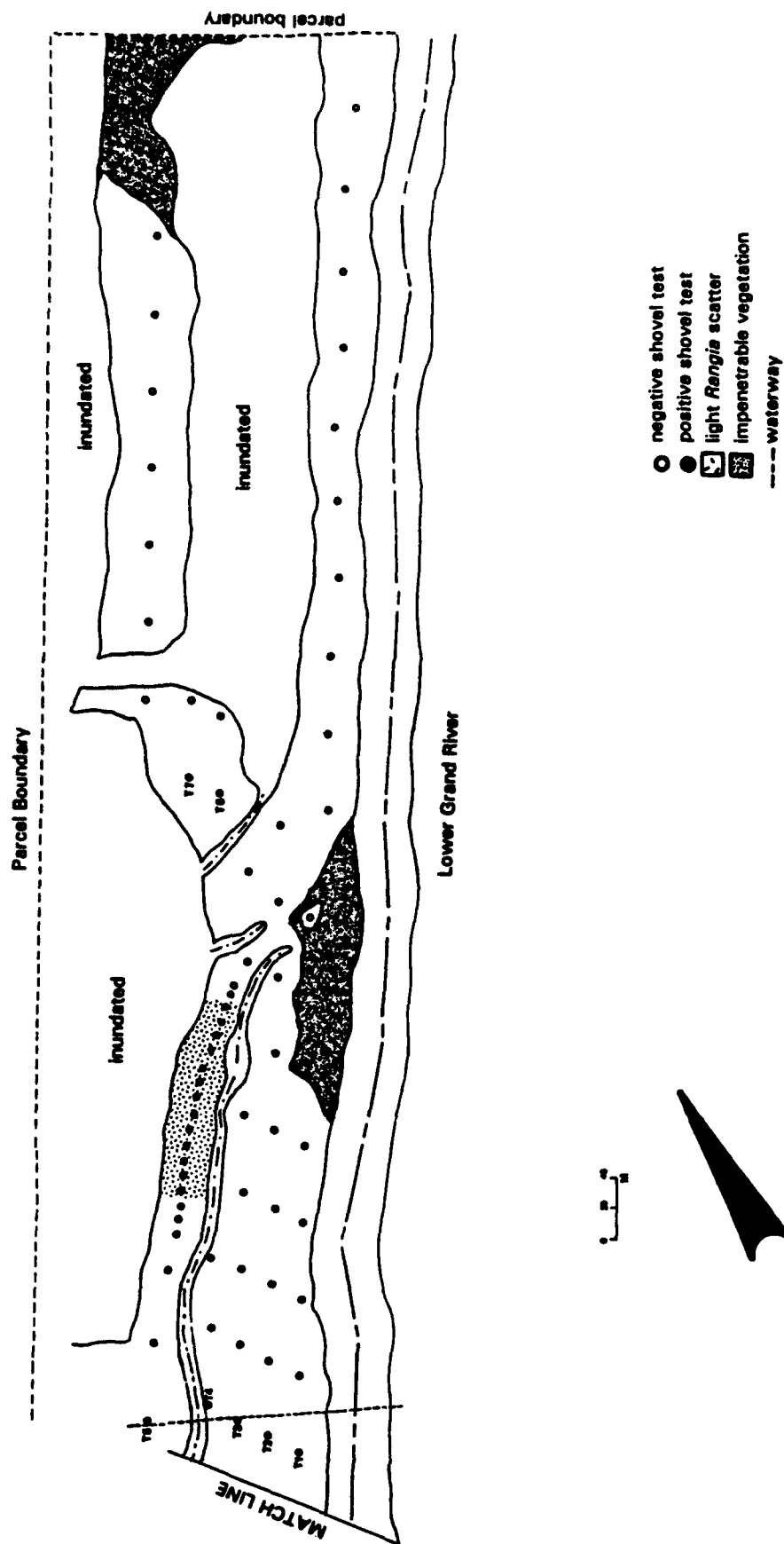


Figure 20. Shovel tests within the Item E-64 borrow area.

The soil in this parcel was a very dark gray (10YR 5/4) clay. Through the use of a soil sampler, it was determined that the clay extended to a depth of at least 150 cm. Only in isolated tests in the farthest transects from the river was any other soil type noted. In those cases, a shallow layer of topsoil was present above the clay. The thickest deposit of topsoil was approximately 10 cm.

A small (0.5 cm) piece of *Rangia* shell was found on the surface at Shovel Test 4 on Transect 5 of Area B. Shovel Tests 5 and 6 on that line were also positive for *Rangia*. Additional tests were placed north of Shovel Test 6, south of Shovel Test 4, and between Shovel Tests 4 and 6, to define the horizontal extent of the shell. To the north was an old borrow pit and to the south was a ditch and negative transect shovel tests (Figure 21).

A total of 40 fragments of *Rangia* shell were recovered from the surface and from shovel tests. However, a 5 X 5 m area revealed only 2 pieces of *Rangia*. None of the shell was larger than approximately 0.5 cm in diameter, and no shell was found below a depth of 15 cm in any of the shovel tests. No cultural materials were collected. In addition, a fragment of modern clear glass was found at 30 cm below surface in one of the shovel tests. It appears that the local hunting club used four-wheelers along the ridge where the shell was located. These four-wheelers have cut ruts into the ridge and may have transported shell in from other contexts in the vehicle tires. Alternately, it is possible that this scatter of shell resulted from the excavation of the borrow pit or adjacent ditch. Thus, it seems likely given the extremely low density and fragmentary nature of the shell that this is not a site, and that the *Rangia* was redeposited in the area.

A scatter of oyster shell was discovered at Shovel Test 8 on Transect 4 of Area A. In order to define the subsurface extent of the scatter, reduced interval shovel tests were excavated in each of the cardinal directions. These tests were placed at 5 m intervals due to the small site dimensions. Shovel test N0 W8 was offset to avoid the creek. A total of 13 shovel tests were excavated during site definition, of which seven were positive (Figure 22, Table 6).

A 50 x 50 cm test unit was excavated 1 m west of the site datum. Excavation was in 10 cm levels to a depth of 50 cm, and soils were screened whenever possible. Wet and clayey soils were carefully troweled to recover artifacts.

As seen in Figure 23, the uppermost stratum in the excavation unit consisted of a 7.5YR 3/2 (dark brown) clay. At the bottom of this stratum, and extending into the underlying 10YR 5/4 (yellowish brown) clay, was an oyster shell lens. Large brick fragments (half brick sized) were also recovered from within the yellowish brown clay. These were concentrated along the west wall of the unit, but they did not appear to have been intentionally laid (Figures 23 and 24). This soil was sterile below a depth of about 30 cm. Beneath this was a layer of 10YR 5/3 (brown) sterile clay.

Artifacts recovered from this unit included large fragments of a late spatter bowl, metal, glass, coal, and a few sherds of *Rangia* (Table 6). The presence of late spatter suggests a late-nineteenth or early-twentieth-century date for the site. However, recovery of modern-looking clear bottle glass at a depths of 20-30 cm below surface may indicate that the site is even more recent. The fact that all ceramics found at the site derived from a single late spatter bowl indicates that this was probably not a

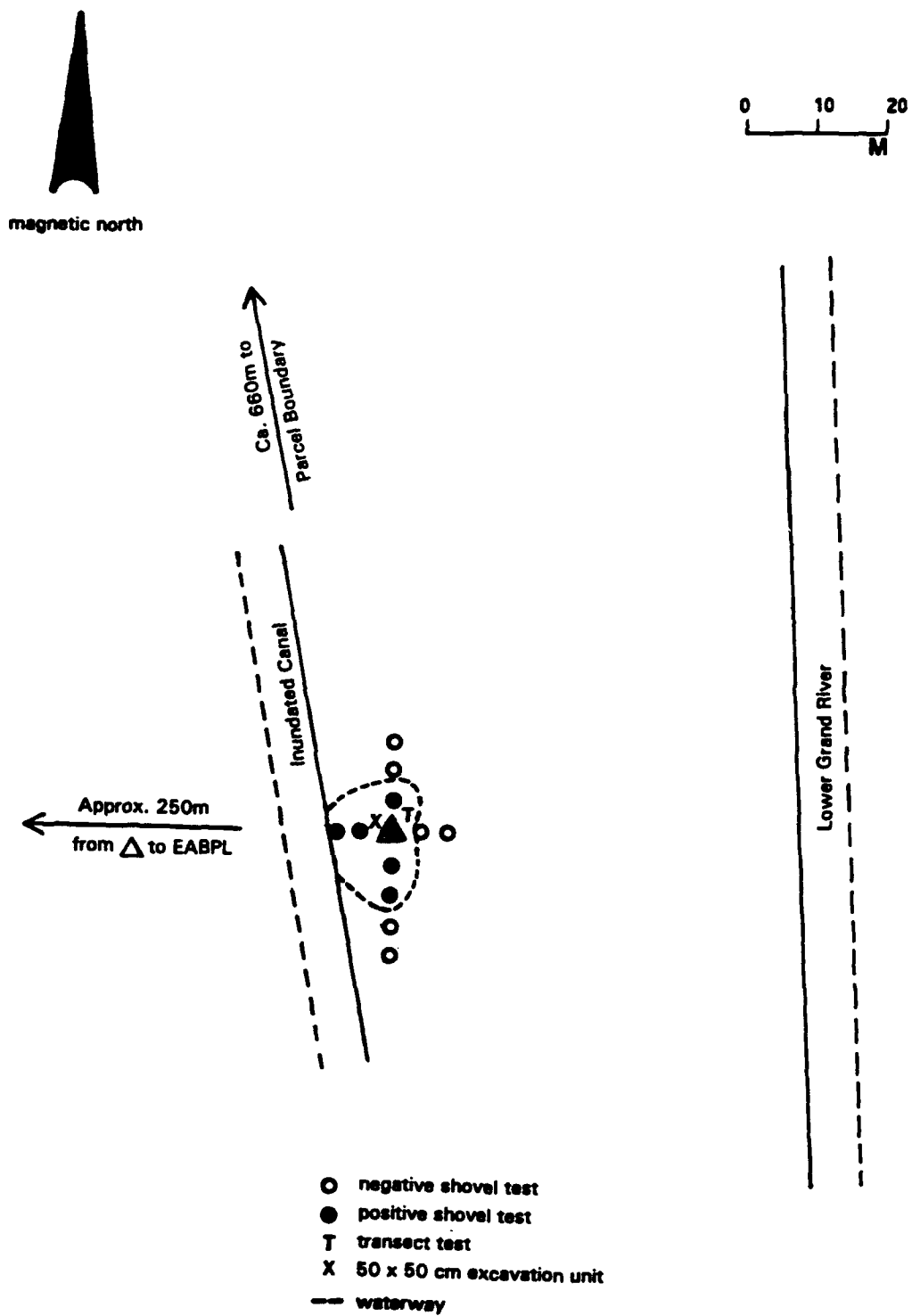


Figure 22. Detail of site definition of 16IV23 within the Item E-64 borrow area.

Table 6. Artifacts from Site 16IV23.

Shovel Tests:

S10 E0

13 oyster shells (13 g)

S5 E0

1 modern clear glass

4 oyster shells (3.1 g)

1 slag fragment (22.4 g)

N0 E0 (Shovel Test 8, Transect 4, Area A)

3 late spatter bowl fragments

1 brick fragment (3.5)

90 oyster shell (913.4 g)

N5 E0

9 coal fragments (110.0 g)

N0 W8

4 coal fragments (4.8 g)

N0 W5

2 coal fragments (8.0 g)

50 x 50 cm Excavation Unit:

0-10 cm bs

3 late spatter bowl fragments

1 light green bottle glass

1 animal tooth

20 oyster (69.9 g)

10-20 cm bs

1 light green soda bottle base

2 olive glass

51 oyster (803.7 g)

3 *Rangia* (21.7 g)

2 coal fragments (112.8 g)

2 brick fragments (23.1 g)

20-30 cm bs

1 late spatter bowl fragment

2 clear bottle or jar fragments (one base)

1 agricultural machinery gear fragment

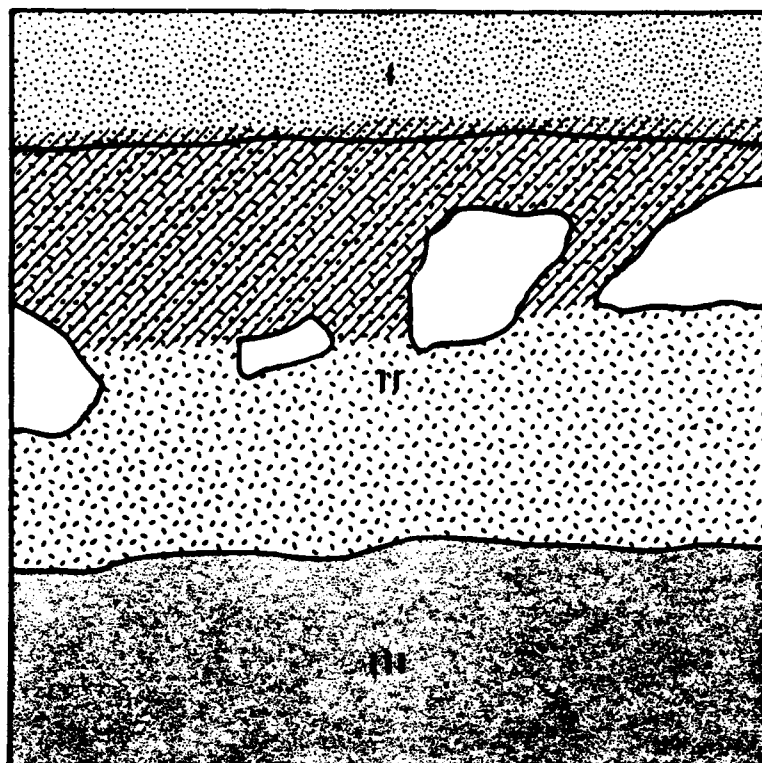
1 amorphous metal

5 oyster (22.6 g)

3 brick fragments (141.2 g)

Bricks Removed from West Wall

7 brick fragments (5423.6 g)



0 5 10
cm

□ brick
▨ shell lens

I	7.5YR 3/2 (dark brown) clay
II	10YR 5/4 (yellow br wn) clay
III	10YR 5/3 (brown) clay

Figure 23. West profile of 50 x 50 cm unit at site 16IV23 within the Item E-64 borrow area.

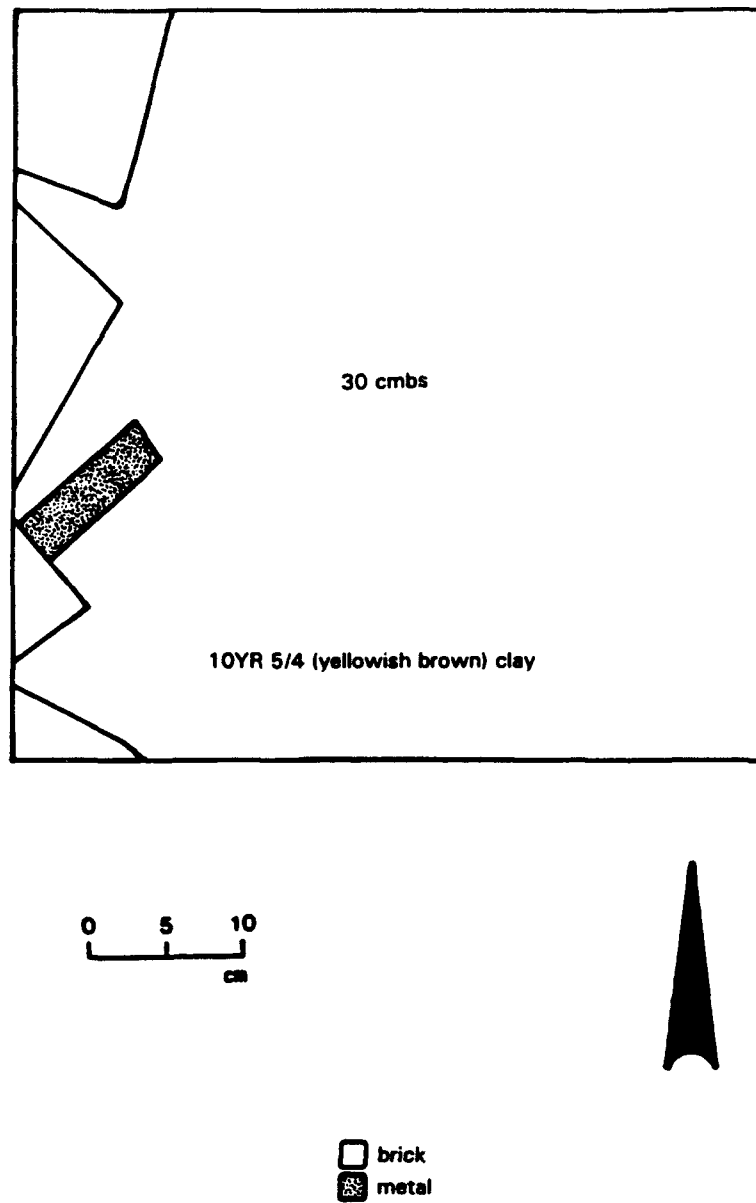


Figure 24. Plan view of 50 x 50 cm unit at site 16IV23 within the Item E-64 borrow area.

domestic occupation. In addition, the coal, the machinery gear fragment, the shell, and the brick fragments are suggestive of an industrial function for the site.

The paucity of artifacts and the shallow nature of the deposit suggests that the site was occupied for a relatively short period of time. As seen in Chapter 5, historical research indicates that this area had a low probability of historic site occurrence. However, the placement of agricultural machinery (such as a drainage pump) in the area is not unlikely given the cultivation of this vicinity both before and after the Civil War.

Shovel tests indicated that this site is relatively small, measuring only 15 m x 20 m. This, in conjunction with the low artifact density and shallow depth of the deposit, indicates that the site has little, if any, research potential. This site should not be considered eligible, nor potentially eligible, for nomination to the National Register of Historic Places.

Item E-76 Borrow Area

The Item E-76 borrow area is located approximately 1.7 miles north of the Iberia/St. Martin Parish line in Iberia Parish. LA Highway 997 parallels the parcel to the east, and Little Goddel Bayou is the westernmost boundary. The dimensions of this parcel are approximately 230 m east/west and 450 m north/south. Item E-76 is approximately 35 acres.

A baseline was set up for this survey along the southern boundary of the parcel. Transect lanes were then spaced at 20 m intervals along the baseline, with the first transect located 20 m from Little Goddel Bayou. A total of eleven transects were positioned along the baseline. Shovel tests were then excavated in a staggered pattern at 50 m intervals along the transects. However, approximately 70% of the area was inundated (Figure 25). The soil in the Item E-76 borrow area consists of a dark gray (10YR 5/4) clay to a depth of two meters below the surface. The water table was present in most shovel tests at a depth of 20-30 cm below surface.

A very light surface scatter of *Rangia* shell was discovered near the edge of Little Goddel Bayou on Transect 1, 20 m south of Shovel Test 2. A shovel test was excavated within the highest concentration of shell (two fragments measuring less than 1.5 cm), and shovel tests were excavated at 10 m intervals to the north, south, and west of this point. No east test was possible due to the presence of Little Goddel Bayou (Figure 26). Only the southern test was positive, and it contained a single *Rangia* shell at 2 cm below surface. However, a modern beer bottle neck fragment found at 30 cm depth indicates that the *Rangia* was recently deposited. No other shell or artifacts were recovered from subsurface contexts. A 5 x 5 m surface area contained only 10 pieces of shell. The low density of shell and especially the presence of modern material below the depth of the *Rangia* indicates that this area is not a prehistoric site.

Item E-84a Borrow Area

This area is located approximately 0.1 mile south of Pierre Part, Louisiana, and 100 m west of LA Highway 70. North of the parcel is a pipeline which runs from Lake Verret west to Old River. The approximate dimensions of this parcel are 250 m east/west and 750 m north/south. The Item E-84a borrow area is about 40 acres.

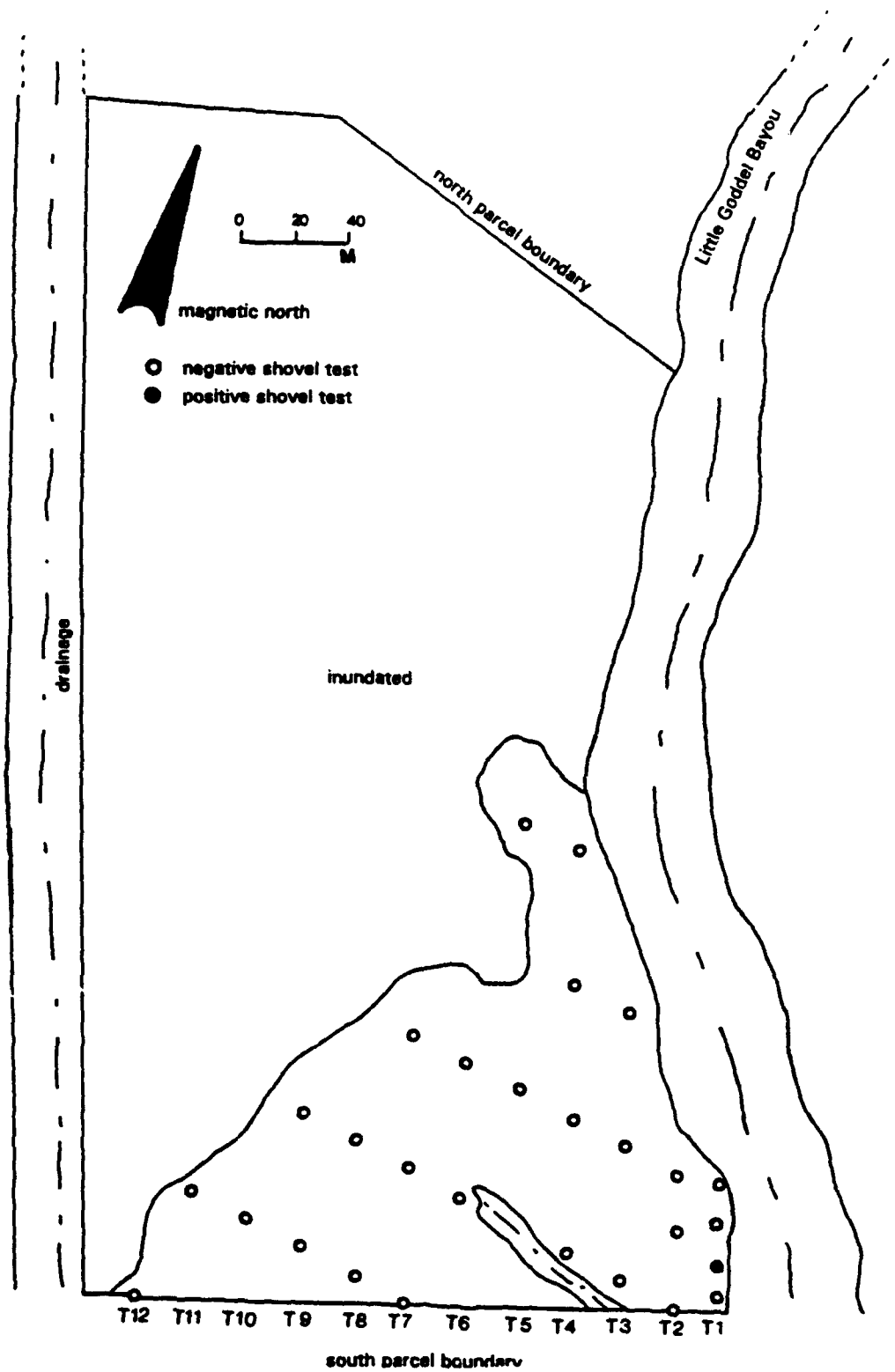


Figure 25. Shovel tests within the Item E-76 borrow area.

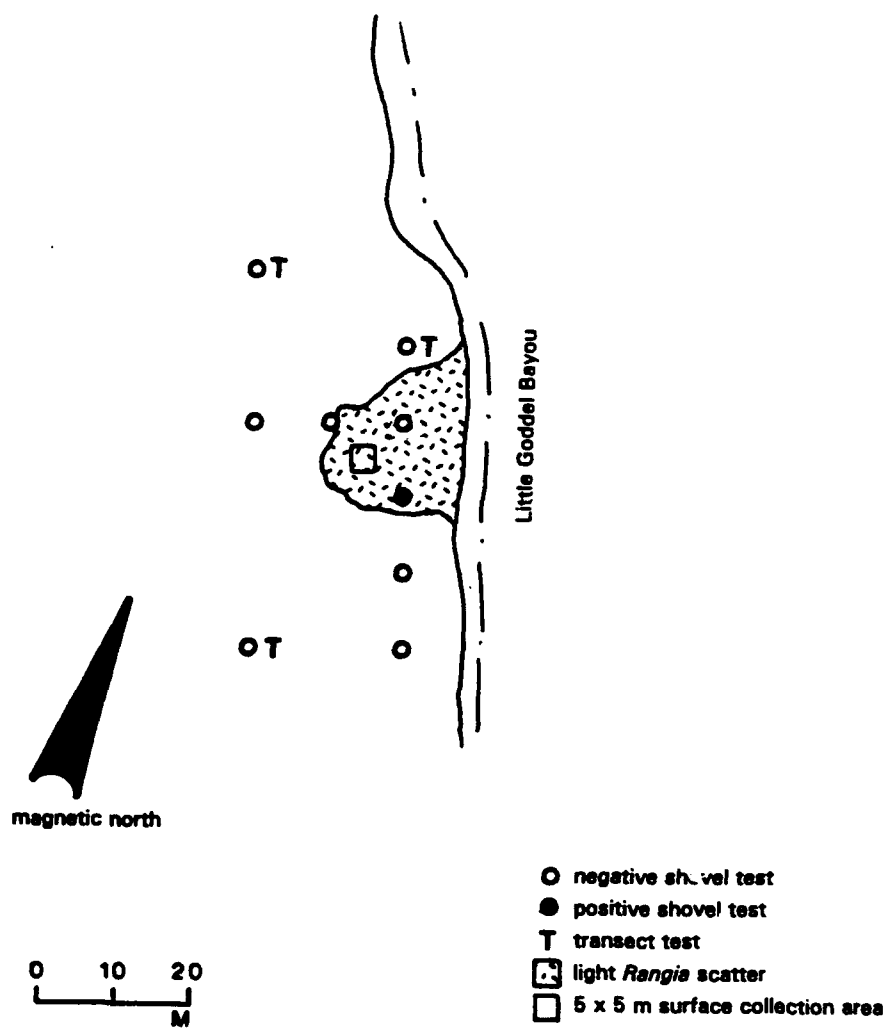


Figure 26. Detail of area where *Rangia* was found within the Item E-76 borrow area.

A small access road is located approximately 200 meters from the south parcel boundary. This road bisects the parcel from east to west. This road was used as a baseline, and transects were run north and south from the road. The terrain consists of ridges running north/south. The areas between the ridges were completely inundated, thus precluding shovel testing. This being the case, it was necessary to run the transects along the tops of the ridges. Rarely did this permit consistent staggering of shovel tests or 20 m intervals between lines. A total of eight transect lines were utilized in this parcel (Figure 27).

The soil within the parcel consists of dark gray (10YR 5/4) clay to a depth of at least two meters. One large shovel test was excavated to a depth of one meter, but no stratigraphic changes could be discerned. A soil probe placed in the bottom of this test revealed nothing but clay for an additional meter.

A scatter of *Rangia* shell covering an approximately 100 x 100 m area was discovered in a clearing on the western edge of the parcel. Shovel tests were excavated at 10 m intervals in each of the cardinal directions from Shovel Test 2 on Transect 8, which was located in the approximate center of the scatter. No shells were recovered below a depth of 12 cm below surface, and no prehistoric cultural materials were recovered. Also, a layer of plastic sheeting was noted at 20-30 cm depth in three of the tests.

A discussion with the land-manager, Mr. Dennis Landry (personal communication 1993), revealed that the clearing is a previous oil company drilling locale. The drilling occurred within the last 10 years. This, in conjunction with the layer of plastic sheeting beneath the shell, indicates that this scatter is the result of recent drilling activity, and is not an archeological site.

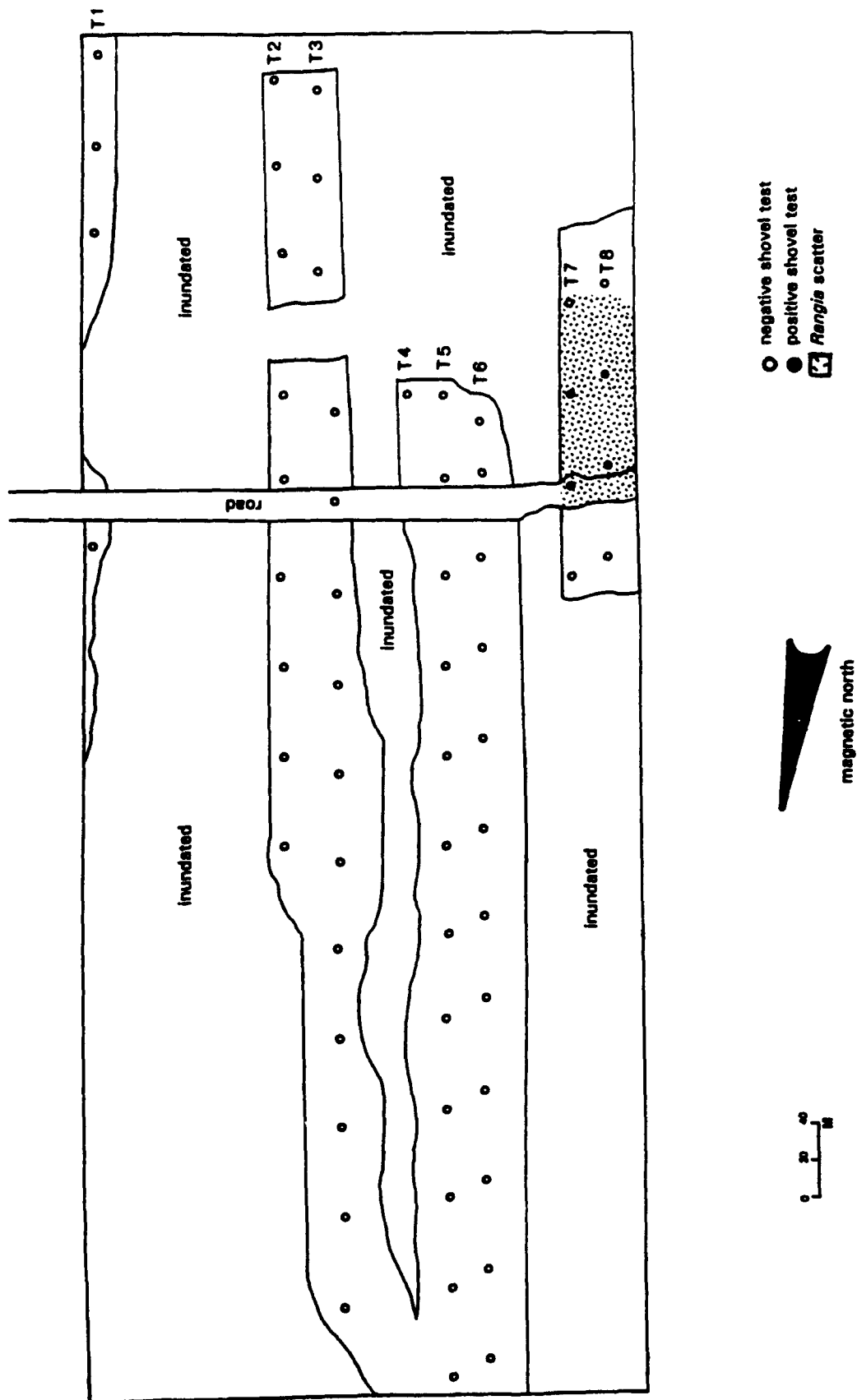


Figure 27. Shovel tests within the Item E-84a borrow area.

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

Archeological survey was conducted in three proposed offsite borrow areas near the EABPL: Item E-64, Item E-76, and Item E-84a. Shovel tests to depths of 50 cm were excavated within each of these areas. Only a single historic site was discovered in the Item E-64 borrow area. Item E-76 and Item E-84a each contained a recent deposit of *Rangia* shell with no associated cultural debris.

As noted in Chapter 2, a geomorphological study of the three areas indicates that a relatively high rate of deposition has occurred. Thus, although Item E-64, Item E-76, and Item E-84a represent high-probability areas, sites are likely buried too deeply for shovel testing to discover (as much as 2 to 3 m below the present surface of the natural levee). Shovel testing in each of the proposed borrow areas recovered modern debris as deep as 25 cm. In situations of high sedimentation, shovel tests even when supplemented with auger tests will not necessarily reveal deeply-buried archeological deposits. However, the sediments that bury sites and make them difficult to locate also have the effect of protecting the sites from all but the deepest ground-disturbing activities.

By contrast, Item E-76 lies within a backswamp of Little Goddel Bayou. No natural levees suitable for settlement were present within this area; thus, prehistoric sites are unlikely. Survey of such low probability areas, particularly when sedimentation is high, is very likely to be unproductive.

Thus, it is recommended that future surveys in areas with high sedimentation emphasize high probability areas. Auger tests, mechanical excavation, remote sensing or a combination of these techniques would be more likely to discover deeply-buried sites. Then too, investigations should be focused on areas that are likely to undergo deep ground disturbance. In this manner, resources can be concentrated on areas that are the most likely to contain sites that will be affected by planned activities.

As discussed in Chapter 5, all three of the areas were considered low probability for the presence of historic sites. However, of the three parcels, Item E-64 had the highest probability for historic activity because of cultivation in this vicinity before and after the Civil War. The single site discovered during this survey effort, 16IV23, was located within this item. The site consisted of a scatter of oyster shell, brick, coal, and historic artifacts. The paucity of domestic refuse, the small size of the site, and the presence of the coal, oyster, brick, and a machinery part all suggest that this may have been a locale of industrial/agricultural activity, such as a pump station.

Site size and artifact density at 16IV23 indicates that little additional information can be gained from this site. The site is not eligible nor potentially eligible for inclusion on the National Register of Historic Places. In addition, no sites were identified in Items E-76 and E-84a. Borrowing in these three areas will not impact any significant archeological deposits. No further work is recommended.

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APPENDIX I
SCOPE OF SERVICES

September 23, 1993

REVISED*
Scope of Services
Cultural Resources Survey
of EABPL Off-Site Borrow Areas,
Levee Items E-64, E-76 and E-84,
Iberville, Iberia and Assumption Parishes, Louisiana

1. Introduction. The work to be performed under this delivery order consists of a cultural resources survey of three proposed offsite borrow areas near the East Atchafalaya Basin Protection Levee (EABPL). Cultural resources survey is required because the borrow sites are located in high probability areas and are outside the limits of the comprehensive levee survey performed in 1982 by Gibson.

At present, no cultural resources are recorded within the proposed borrow areas. However, numerous known prehistoric sites are located in immediate proximity to the survey areas. These sites are located on natural levee ridges of relict distributary channels. These elevated ridges have a moderate to high potential for the occurrence of prehistoric archeological sites. Because the three borrow areas are located outside of the Atchafalaya Basin Floodway, recent site burial is not expected to be a problem for this survey.

2. Study Area. The study area consists of three borrow pits proposed for EABPL Items E-64, E-76, and E-84. The study area for Item E-64 consists of the remaining portions of the former E-58 borrow site (see attachment 1). This borrow area is located on the west bank of Lower Grand River just below the Bayou Sorrel Lock in Iberville Parish. The study area for Item E-76 consists of site 1 of the former E-69 borrow area (see attachment 2). This borrow area is located on the west bank of Little Goddel Bayou near the southeastern corner of Iberia Parish. The study area for E-84 consists of new Corps right-of-way on property where adjacent portions have previously been utilized for borrow activities. This proposed borrow area is located just west of Louisiana Highway 70 below the town of Pierre Part in Assumption Parish.

3. General Nature of the Work. The study will consist of historical and literature research relative to the overall study area, intensive cultural resources survey of the proposed borrow areas, and data analysis and report preparation.

*Revisions are shown in italics.

4. Study Requirements. The study will be conducted utilizing current professional standards and guidelines including, but not limited to:

- National Register Bulletin 15 entitled, "How to Apply the National Register Criteria for Evaluation;"
- the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation as published in the Federal Register on September 29, 1983;
- Louisiana's Comprehensive Archeological Plan dated October 1, 1983; and
- The Advisory Council on Historic Preservation's regulation 36 CFR Part 800 entitled, "Protection of Historic Properties."

The study will be conducted in three phases: Historical and Literature Research, Field Survey, and Data Analysis and Report Preparation.

A. Phase 1: Historical and Literature Research. The study will begin with research of archeological, historical and geological literature, maps and records necessary to establish the natural and historic setting and predict the nature of the cultural resources in the study area. The status of archeological research and the nature of the resource base in the study area will be assessed through the review of pertinent literature and the records of the Louisiana Division of Archaeology.

Historical research will include literature review and review of other written, cartographic and aerial photography records sufficient to reconstruct the historic uses of the study areas. The geological research will include review of available published and unpublished data to assess landscape geomorphology.

B. Phase 2: Field Survey. Upon completion of phase 1, the Contractor shall initiate the fieldwork in the three proposed borrow areas. The intensive pedestrian survey will utilize lane spacing of 20 meters and a shovel testing interval of 50 meters in an offset pattern. Variations in transect layout and shovel testing regimes will be necessary in portions of the borrow areas where previous disturbance or standing water precludes a normal survey grid. Where feasible, survey transects shall be oriented parallel to the former distributary channels to maximize site discovery potential.

Shovel tests will be approximately 30 x 30 cm in the horizontal plane and will be excavated to sterile subsoil (a

minimum of 50 cm deep). The excavated soil will be screened through 1/4 inch wire mesh, where feasible. Soils which are too wet or clayey for efficient screening will be thoroughly trowel searched for artifact recognition and recovery.

During the conduct of the survey, all sites located in the survey areas will be subject to a program of site definition to ascertain horizontal extent, depth of cultural deposits, and cultural/temporal affiliation. A datum will be established at each site location. This will be followed by a minimum of two bisecting lines (normally at 90 degree angles in the cardinal directions) of screened shovel tests outward from the site datum to define horizontal extent. Limited, controlled surface collection of artifacts will supplement artifacts located in the shovel tests. Auger tests will be placed as needed to ascertain site depth and stratigraphy. Site maps will be prepared for each site utilizing tape and compass to map important natural and cultural features, and the locations of shovel and auger tests. All shovel/auger tests and excavation units will be immediately backfilled upon completion of archeological recordation.

Immediately upon completion of the field survey and site definition phase, the Contractor will consult with the COR if any archeological sites located in the survey areas require more extensive site assessment procedures to determine their National Register status (e.g. eligible or not eligible). After consultation, the COR and Contracting Officer will determine if additional site testing procedures should be added to the present scope of services.

At the conclusion of all required fieldwork, unexpended field time may be utilized to visit previously recorded archeological sites in the study area vicinity. The Contractor is responsible for obtaining his own rights of entry to any sites outside the designated study areas.

At a minimum, site maps will show site boundaries, locations of site datum, features and artifact scatters, locations of all subsurface testing units, and prominent natural and cultural features in the site area. Although x,y coordinates or tie-ins to benchmarks are not required, all site maps will contain adequate information to tie site data to permanent landmarks in the borrow areas. Such landmarks include property corners, junctions of road/levees, etc.

For all sites discovered during the survey, the Contractor will file state site forms with the Louisiana State Archeologist and cite the resulting state-assigned site numbers in all draft and final reports. In addition, the Contractor will submit site update forms to the State Archeologist for any new information on previously recorded sites. These forms will correct previously filed information where appropriate and summarize the results of

the present investigation. All sites located within the survey area will be recorded to scale on the project maps (attachments 1-3) and the appropriate 7.5 minute quadrangle maps. The quadrangle maps will be utilized to illustrate the site forms. One copy of each site and site update form will be submitted to the COR with the draft report.

C. Phase 3: Data Analyses and Report Preparation. All data will be analyzed using currently acceptable scientific methodology. The Contractor shall catalog all artifacts, samples, specimens, photographs, drawings, etc., utilizing the format currently employed by the Louisiana State Archeologist.

All cultural resources located by the survey will be evaluated against the National Register criteria contained in Title 36 CFR Part 60.4 to assess their potential eligibility for inclusion in the National Register. The Contractor will classify each site as either eligible for inclusion in the National Register or not eligible. In the case of sites which the Contractor recommended for additional site assessment at the conclusion of the field survey and the Government opted not to perform site testing as an amendment to this scope of services, the Contractor may assess such sites as potentially eligible. The Contractor shall fully support his recommendations regarding site significance. The Contractor shall also recommend detailed mitigation measures for all sites classified as eligible.

The analyses will be fully documented. Methodologies and assumptions employed will be explained and justified. Inferential statements and conclusions will be supported by statistics where possible. Additional requirements for the draft report are contained in Section 5. of this Scope of Services.

5. Reports:

A. Draft Reports (Phase 1-3). Six copies of the draft report integrating all phases of this investigation will be submitted to the COR for review and comment within 10 weeks after delivery order award. Along with the draft reports, the Contractor shall submit:

- (1) One copy of project maps and 7.5 minute quadrangle maps marked with the locations of all sites and standing structures in the survey area;
- (2) one copy of each site, site update, and standing structure form;
- (3) three copies of the National Register Registration Forms for each site recommended as eligible for inclusion in the National Register. This documentation will contain all of

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the data required by NPS National Register Bulletin 16: Guidelines for Completing National Register of Historic Places Forms.

The written report shall follow the format set forth in MIL-STD-847A with the following exceptions: (1) separate, soft, durable, wrap-around covers will be used instead of self covers; (2) page size shall be 8-1/2 x 11 inches with 1-inch margins; (3) the reference format of American Antiquity will be used. Spelling shall be in accordance with the U.S. Government Printing Office Style Manual dated January 1973.

B. Final Reports. The COR will provide all review comments to the Contractor within 6 weeks after receipt of the draft reports (16 weeks after work item award). Upon receipt of the review comments on the draft report, the Contractor shall incorporate or resolve all comments and submit one preliminary copy of the final report to the COR within 4 weeks (20 weeks after work item award). Upon approval of the preliminary final report by the COR (within 1 week after submittal), the Contractor will submit 30 copies and one reproducible master copy of the final report to the COR within 24 weeks after work item award. The Contractor will also provide computer disk(s) of the text of the final report in Microsoft Word or other approved format.

Included as an appendix to the Final Report will be a complete and accurate listing of cultural material and associated documentation recovered and/or generated. In order to preclude vandalism, the final report shall not contain specific locations of archeological sites. Site specific information, including one set of project maps accurately delineating site locations, site forms, black and white photographs and maps, shall be included in an appendix separate from the main report.

6. Discovery of Human Skeletal Remains. In the event that the field survey or site testing procedures performed during this study encounter unmarked burial sites or human skeletal remains, the provisions of the Louisiana Unmarked Human Burial Sites Preservation Act [Louisiana R.S. 8:671 through 681 and R.S. 36:209(I) and 802.13] shall apply. Upon discovery of such remains, the Contractor shall immediately cease activities which could further disturb the unmarked burial, human skeletal remains or associated burial artifacts. The Contractor will notify the Contracting Officer's Representative of the discovery as soon as possible to determine the appropriate plan of action regarding the discovery. The Contractor will also be responsible for notification of the law enforcement agency with jurisdiction over the remains within 24 hours of its discovery. The COR will notify the Louisiana Division of Archeology of the discovery. In no

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event will human skeletal material be excavated and/or collected from the field without approval of the COR.

7. Attachments: (Previously provided)

1. E-64 Borrow Site: Borrow Area R/W shown on Drawing 4, File No. H-8-27237
2. E-76 Borrow Site: Site 1 Plan, E-69.0 shown on Plate 2, File No. H-8-40239
3. E-84 Borrow Site: Tract 4 shown on map entitled "Survey of Property of S. Gumbel & Acme Land Co." and dated October 1953, last revision 3/31/78